

HAMILTON'S
ESSENTIALS OF
ARITHMETIC

LOWER
GRADES

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HAMILTON'S ESSENTIALS OF ARITHMETIC LOWER GRADES

BY

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HAM. ESSEN. OF AR. — LOWER GRADES

W. F. 30

PREFACE

THIS series of "Essentials of Arithmetic" consists of three books, which cover the arithmetical work from the second to the eighth year.

The two important ends sought in the teaching of arithmetic are (1) to give the pupil such a mastery of number combinations and processes as will enable him to perform with accuracy and speed all common numerical operations; and (2) to train him in the skillful application of these processes to the problems that he is likely to meet in his daily experiences. This series has aimed to lay equal stress on both these important phases of arithmetic.

The frequent drills in numbers in their abstract relations develop habits of accuracy and speed. The motivation of the drill work, especially in the earlier grades, is secured by means of interesting number games.

The problems have been framed with a view to the pupil's interests. At first they deal entirely with his life at home, at school, on the street, and in the playground; but gradually they reach out to include his contact with the larger spheres of social and industrial life. The problems are of two types, —first the isolated problems, which provide direct application of a principle to some need or experience of the pupil; and, second, groups of related problems, called "Everyday Use of Numbers," which center about an idea or a situation in which the pupil feels a vital interest. These related problems serve as a review of various principles previously taught. The problems are all *real* because they are true to life. They carefully avoid unpractical conditions and all questions that have no relation to common experience.

The pupil's self-activity is utilized in constructive work and in the framing of original problems. His initiative is exercised by leading him to discover many arithmetical truths for himself. The importance of the correct interpretation of problems and of the choice of the best methods for their solution is emphasized.

This book for **Lower Grades** covers the work that is usually taught in the second, third, and fourth years, each chapter representing one half year's work. The second year's work, contained in Chapters I and II, may be used as review for classes that begin the use of a text-book in the third year. Chapters III and IV comprise the third year's work and Chapters V and VI, the fourth year's work.

The effort to follow prevailing prices has been limited by their rapid fluctuations and by their variation in different parts of the country. Teachers should encourage pupils occasionally to substitute current local prices, thereby varying the problems in the book.

SAMUEL HAMILTON

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YOU are about to take a long journey through Numberland. On the way you will meet some old friends and many new ones.

Sometimes you will linger to enjoy a merry game. At other times you may have some hard hills to climb ; but when you get to the top you will feel well repaid for your efforts. You will gain strength as you go along and every step will make the next one easier.

We wish you a happy journey.

CHAPTER I

IN THE FARMYARD

one
1



two
2



three
3



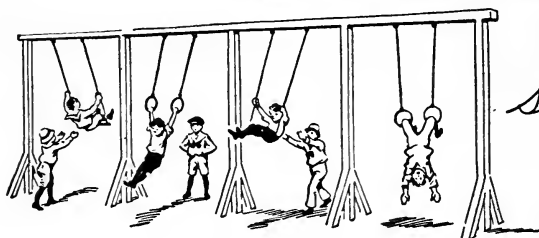
four
4



five
5



six
6



seven
7

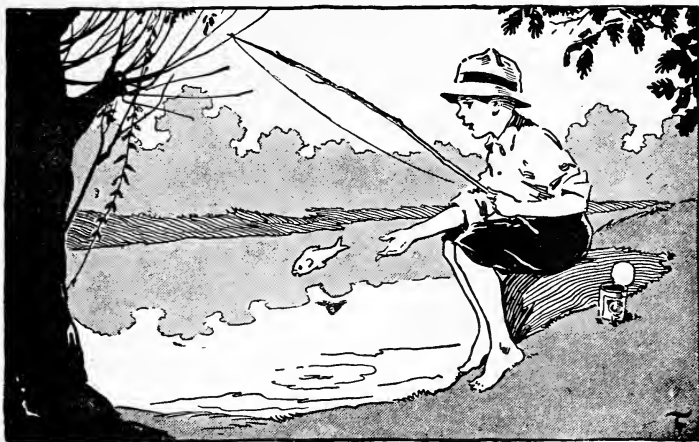
eight
8



nine
9

ten
10





1. Read this Mother Goose rime:

One, two, three, four, five:

I caught a fish alive.

Six, seven, eight, nine, ten;

I put it back again.

1, 2, 3, 4, 5;

I caught a fish alive.

6, 7, 8, 9, 10;

I put it back again.

Numbers tell *how many*. You can write numbers either in words or in figures.

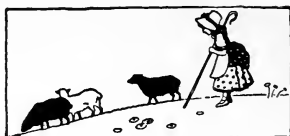
one	two	three	four	five	six	seven	eight	nine	ten
1	2	3	4	5	6	7	8	9	10



2. Read the numbers on this blackboard.

3. Write in figures: one, two, three, four, five, six, seven, eight, nine, ten.

$1 + 1 = 2$ $2 + 1 = 3$ $1 + 2 = 3$



 and  are 2 sheep.

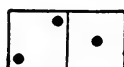
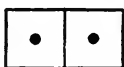
 and   are 3 sheep.

  and  are 3 sheep.

1. Little Bo Peep has 2 black sheep and 1 white sheep. How many sheep has she?

2. Draw 1 sheep and 1 sheep. How many sheep have you drawn?

3. How many lambs are 1 lamb and 2 lambs?



4. How many are 1 and 2? 1 and 1? 2 and 1?

The sign $+$ means *and* or *plus*.

The sign $=$ means *equal* or *equals*.

$$2 + 1 = 3.$$

2 *plus* 1 *equals* 3.

5. Read: $1 + 1 = 2$ $2 + 1 = 3$ $1 + 2 = 3$

6. Little Bo Peep saw 2 sheep in the meadow and 1 sheep in the lane. How many sheep did she see in all?

7. Tell a number story about 1 girl and 2 girls.

$2 - 1 = 1$ $3 - 2 = 1$ $3 - 1 = 2$



1. Jack Horner has 3 plums. He eats 1 plum. How many plums has he left?

○○○ 3 plums less 1 plum = 2 plums.

2. Jack takes 2 plums from 3 plums. How many plums are left?

○○○○ 3 plums less 2 plums = 1 plum.

3. Jack has 2 plums. He gives 1 plum to his sister. How many plums has he left?

○○ 2 plums less 1 plum = 1 plum.

The sign $-$ means *less* or *minus*.

$$3 - 2 = 1.$$

3 less 2 equals 1, or 3 minus 2 equals 1.

4. Read: $3 - 1 = 2$ $2 - 1 = 1$ $3 - 2 = 1$

5. 2 thumbs less 1 thumb are how many thumbs?

6. Tell a number story about 2 pies less 1 pie.

7. Tell a number story about 3 boys less 2 boys.

8. Give the answers:

$3 - ? = 2$

$1 + ? = 3$

$2 - 1 = ?$

$? - 2 = 1$

$1 + 1 = ?$

$? + 1 = 3$

$3 + 1 = 4$	$4 - 3 = 1$	$4 + 1 = 5$	$5 - 4 = 1$
$2 + 2 = 4$	$4 - 2 = 2$	$3 + 2 = 5$	$5 - 3 = 2$
	$4 - 1 = 3$		$5 - 2 = 3$
			$5 - 1 = 4$



1. Mary picked 1 poppy. Then she picked 3 more poppies. How many poppies did she have then?

2. Mary counted 4 daisies in her garden. She picked 1 daisy. How many daisies were left in the garden?

3. There were 2 girls playing in the garden; 3 more girls came to play with them. How many girls were then playing?

4. Draw 4 violets. Rub out 2 violets. How many violets are left?

5. Write two groups of 2 numbers whose sum is 5.

6. From a bush containing 5 roses, 3 roses were picked. How many roses were left on the bush?

7. Jack had 5 tulips. He gave 2 tulips to Jill. How many tulips had he then?

8. Tell a number story about 2 lilies and 2 lilies.

9. Tell a number story about 3 pansies and 2 pansies.

10. $2 + 2 = ?$ $4 + 1 = ?$ $3 + 1 = ?$ $2 + 1 = ?$

11. $1 + 3 = ?$ $1 + 4 = ?$ $2 + 3 = ?$ $3 + 2 = ?$

12. $4 - 1 = ?$ $4 - 2 = ?$ $4 - 3 = ?$ $3 - 2 = ?$

13. $5 - 4 = ?$ $5 - 3 = ?$ $5 - 1 = ?$ $5 - 2 = ?$

1 inch2 inches3 inches

1. How long is the first line? the second line? the third line?

2. How long are the first and second lines together? the first and third lines? the second and third lines?

3. Draw lines 1 inch long, 2 inches long, 3 inches long, 4 inches long, and 5 inches long. Make problems about adding them.

4. Tell number stories, using the following numbers:

$2+2$	$5-2$	$1+3$	$5-4$	$2+1$	$3-3$
$4+1$	$4-3$	$2+3$	$4-4$	$5-3$	$4-2$

Numbers to be added are also written like this:

$$\begin{array}{r} 3 \\ 2 \\ \hline 5 \end{array}$$

5 is called the **sum** of 2 and 3.

5. Give the sums:

4	3	1	2	3	1	1	2	2	1
<u>1</u>	<u>2</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>3</u>	<u>2</u>	<u>4</u>

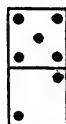
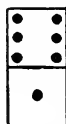
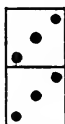
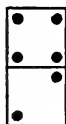
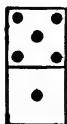
6. Supply the missing numbers:

$3+?=4$	$2+?=5$	$2+?=4$	$3+?=5$
$4-3=?$	$5-2=?$	$4-2=?$	$5-3=?$

7. What number must be added to the lower number to make the upper number?

4	5	3	2	1	5	4	3	5
<u>3</u>	<u>3</u>	<u>2</u>	<u>1</u>	<u>1</u>	<u>2</u>	<u>2</u>	<u>1</u>	<u>4</u>

$5 + 1 = 6$	$6 - 5 = 1$	$6 + 1 = 7$	$7 - 5 = 2$
$4 + 2 = 6$	$6 - 4 = 2$	$5 + 2 = 7$	$7 - 4 = 3$
$3 + 3 = 6$	$6 - 3 = 3$	$4 + 3 = 7$	$7 - 3 = 4$



The first domino shows that $5 + 1 = 6$, that $6 - 5 = 1$, and that $6 - 1 = 5$.

1. Tell what each of the other dominoes shows.

The figure 0 is called zero. It means not any.

$$0 + 6 = 6 \quad 6 + 0 = 6 \quad 6 - 0 = 6 \quad 0 + 7 = 7 \quad 7 + 0 = 7 \quad 7 - 0 = 7$$

2. Add:

$$\begin{array}{cccccccccc} 2 & 5 & 1 & 4 & 3 & 6 & 7 & 0 & 4 & 6 \\ \hline 4 & 2 & 5 & 3 & 3 & 1 & 0 & 6 & 2 & 0 \end{array}$$

Instead of saying "take 2 from 4" you may say "subtract 2 from 4."

When you find what number must be added to a number to make a given number, you subtract.

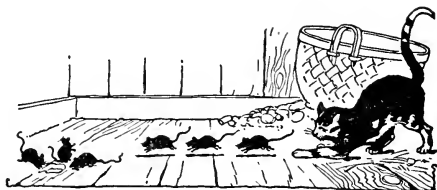
3. Subtract:

$$\begin{array}{cccccccccc} 6 & 7 & 6 & 7 & 6 & 7 & 6 & 7 & 7 & 6 \\ \hline 2 & 4 & 3 & 0 & 5 & 5 & 4 & 2 & 3 & 0 \end{array}$$

4. Edith invited 4 boys and 2 girls to her party. How many children did she invite?

5. How many days are left in a week when 4 days have passed?

One half	$\frac{1}{2}$
----------	---------------



1. There were 6 little mice in a barn. The cat frightened 3 of them away. How many mice remained in the barn?

2. How many mice are one half of 6 mice?

3. What part of the mice stayed in the barn?

4. How many cats are one half of 4 cats?

5. Place 6 pencils in 2 equal groups. What part of the pencils is in the first group? in the second group?

We write *one half of six is three* in this way:

$$\frac{1}{2} \text{ of } 6 \text{ is } 3. \quad \begin{array}{ccc} \bullet & \bullet & \bullet \\ \frac{1}{2} \text{ of } 6 & | & \frac{1}{2} \text{ of } 6 \\ \bullet & \bullet & \bullet \end{array}$$

6. Find $\frac{1}{2}$ of 2 mice.

7. Draw a line 4 inches long. How many inches long is $\frac{1}{2}$ of it?

8. I had 4 cents and paid 2 cents for a chocolate mouse. What part of my money did I spend?

9. Make a drawing to show that $\frac{1}{2}$ of 6 inches is 3 inches.

10. $\frac{1}{2}$ of 4 = ?

$\frac{1}{2}$ of 2 = ?

$\frac{1}{2}$ of 6 = ?

$7 + 1 = 8$	$8 - 7 = 1$	$8 + 1 = 9$	$9 - 8 = 1$
$6 + 2 = 8$	$8 - 6 = 2$	$7 + 2 = 9$	$9 - 7 = 2$
$5 + 3 = 8$	$8 - 5 = 3$	$6 + 3 = 9$	$9 - 6 = 3$
$4 + 4 = 8$	$8 - 4 = 4$	$5 + 4 = 9$	$9 - 5 = 4$

1. Draw dominoes to show all the groups of two numbers whose sum is 8; and all whose sum is 9. Then tell, as on p. 16, what else each domino shows.

2. Add:

4	6	5	8	7	6	4	7	8	9
<u>4</u>	<u>3</u>	<u>3</u>	<u>1</u>	<u>2</u>	<u>2</u>	<u>5</u>	<u>1</u>	<u>0</u>	<u>0</u>

3. Subtract:

8	9	9	8	8	9	8	9	9	8
<u>5</u>	<u>6</u>	<u>7</u>	<u>7</u>	<u>6</u>	<u>4</u>	<u>4</u>	<u>5</u>	<u>1</u>	<u>3</u>

$\bullet \bullet \bullet \bullet$ | $\bullet \bullet \bullet \bullet$
 $\frac{1}{2}$ of 8 $\frac{1}{2}$ of 8

$\frac{1}{2}$ of 8 = ?

4. What number must be added to the lower number to make the upper number?

9	8	8	8	9	9	9	8	9	8
<u>5</u>	<u>5</u>	<u>6</u>	<u>4</u>	<u>7</u>	<u>3</u>	<u>4</u>	<u>2</u>	<u>6</u>	<u>3</u>

5. Find the answers:

$4 + 4 = ?$	$8 - 6 = ?$	$8 - 4 = ?$	$8 + 0 = ?$
$8 - 5 = ?$	$\frac{1}{2}$ of 8 = ?	$3 + 5 = ?$	$8 - 7 = ?$
$5 + 3 = ?$	$6 + 2 = ?$	$8 - 2 = ?$	$7 + 1 = ?$

6. There were 9 frogs in a pond; 3 hopped out. How many frogs were left in the pond?

7. 8 boys were playing leap frog; 4 boys went home. How many boys were left?

One third $\frac{1}{3}$



1. Place 6 cents in 3 equal groups. We call each group one third of 6 cents.
2. What part of 6 cents is in the first group?
3. What part of 6 cents is in the second group? in the third group?
4. How many cents are one third of 6 cents?
5. One third of 6 daisies is how many daisies?
6. One third of 6 pencils is how many pencils?

We write *one third of six is two* in this way:

$\frac{1}{3}$ of 6 is 2. $\frac{1}{3}$ of 6 | $\frac{1}{3}$ of 6 | $\frac{1}{3}$ of 6

7. Draw 9 balls and divide them into 3 equal groups.

○○○ ○○○ ○○○
8. What name is given to each part?
9. Draw a line 9 inches long and divide it into 3 equal parts.
10. How many kittens are $\frac{1}{3}$ of 6 kittens?
11. Ada knitted 9 sweaters. Clara knitted $\frac{1}{3}$ as many. How many sweaters did Clara knit?
12. If $\frac{1}{3}$ of 6 eggs were broken, how many eggs were broken?

13. $\frac{1}{3}$ of 6 = ?

$\frac{1}{3}$ of 9 = ?

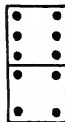
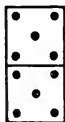
$\frac{1}{3}$ of 3 = ?

$9 + 1 = 10$	$10 - 9 = 1$	$10 - 4 = 6$
$8 + 2 = 10$	$10 - 8 = 2$	$10 - 3 = 7$
$7 + 3 = 10$	$10 - 7 = 3$	$10 - 2 = 8$
$6 + 4 = 10$	$10 - 6 = 4$	$10 - 1 = 9$
$5 + 5 = 10$	$10 - 5 = 5$	



• • • • • | • • • • •

$\frac{1}{2}$ of 10 $\frac{1}{2}$ of 10



1. Draw dominoes to show all the groups of two numbers whose sum is 10. Then tell, as on p. 16, what else each domino shows.

2. From 10 take 8; take 9; 5; 4; 3; 2; 6; 7; 1.

3. Add:

8	4	3	6	9	5	7	1	2
<u>2</u>	<u>6</u>	<u>7</u>	<u>4</u>	<u>1</u>	<u>5</u>	<u>3</u>	<u>9</u>	<u>8</u>

4. 10 children marched out of the shoe in 2 equal rows. How many children were there in each row?

5. One half of 10 children is ——— children.

6. The children had 3 blue balls and 7 red balls. How many balls did they have in all?

7. If 6 of the 10 children were boys, how many were girls?

8. Tell number stories about children, using the numbers in the oblong at the top of the page.

1. Add quickly :

1	2	2	3	3	4				
<u>1</u>	<u>1</u>	<u>2</u>	<u>1</u>	<u>2</u>	<u>1</u>				
3	4	5	4	5	6	4	5	6	7
<u>3</u>	<u>2</u>	<u>1</u>	<u>3</u>	<u>2</u>	<u>1</u>	<u>4</u>	<u>3</u>	<u>2</u>	<u>1</u>
5	6	7	8		5	6	7	8	9
<u>4</u>	<u>3</u>	<u>2</u>	<u>1</u>		<u>5</u>	<u>4</u>	<u>3</u>	<u>2</u>	<u>1</u>

2. Add :

8	6	6	5	5	4	5	3	4	5
<u>2</u>	<u>3</u>	<u>4</u>	<u>2</u>	<u>3</u>	<u>3</u>	<u>4</u>	<u>3</u>	<u>4</u>	<u>5</u>

3. Subtract :

9	7	8	7	8	6	8	9	7	5
<u>4</u>	<u>3</u>	<u>5</u>	<u>4</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>2</u>	<u>3</u>

4. Add :

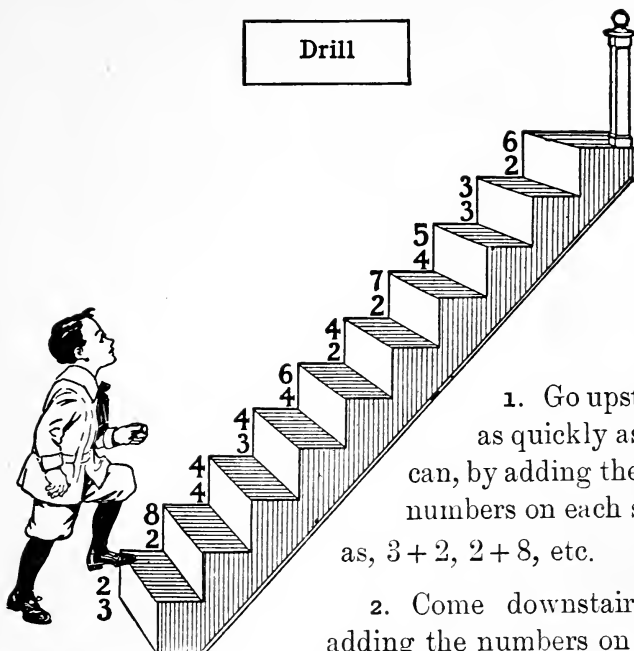
4	3	3	2	6	7	0	4	2	7
<u>6</u>	<u>7</u>	<u>4</u>	<u>8</u>	<u>0</u>	<u>2</u>	<u>5</u>	<u>5</u>	<u>0</u>	<u>3</u>

What number must be added to the lower number to make the upper number ?

5.	8	7	5	6	4	4	5	2	9
	<u>1</u>	<u>6</u>	<u>0</u>	<u>4</u>	<u>2</u>	<u>0</u>	<u>5</u>	<u>0</u>	<u>7</u>

6.	8	7	6	4	5	9	8	6	8
	<u>6</u>	<u>5</u>	<u>2</u>	<u>3</u>	<u>2</u>	<u>6</u>	<u>3</u>	<u>4</u>	<u>5</u>

Drill



1. Go upstairs, as quickly as you can, by adding the two numbers on each step ;

as, $3 + 2$, $2 + 8$, etc.

2. Come downstairs by adding the numbers on each

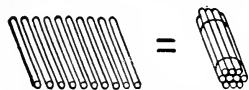
step from top to bottom ; as, $6 + 2$, $3 + 3$, etc.



3. Run along this pavement by subtracting the lower number from the upper number on each flagstone ; as, $7 - 3$, $8 - 6$, $9 - 7$, etc.

7	8	9	7	10	8	9	10	6	10	9	6
3	6	7	2	7	5	6	8	3	6	5	2

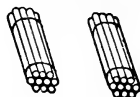
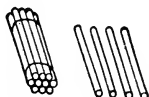
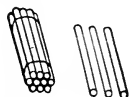
1. Read the following numbers: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10.



2. Tie ten sticks in a bundle, as shown in the picture. 10 ones = 1 ten.

3. Add 1 stick to the bundle.

4. Add 2 sticks to the bundle.



thirteen *fourteen* *twenty*
13 14 20

5. How many are $10 + 3$? 13 means 1 ten and 3 ones.

6. How many are $10 + 4$? 14 means 1 ten and 4 ones.

7. What does 20 mean? 17? 12? 15? 16? 18? 19?

8. Write the numbers from eleven to twenty.

9. Read: 11, 12, 13, 14, 15, 16, 17, 18, 19, 20.

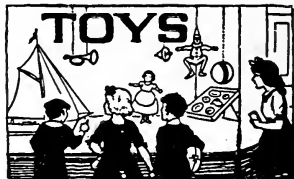
10. Copy:

fifteen *sixteen* *nineteen*
15 16 19

seventeen *eighteen*
17 18

In the Toy Store

Paper doll, 1 cent	Ball, 5 cents
Top, 2 cents	Boat, 6 cents
Whistle, 3 cents	Dominoes, 7 cents
Horn, 4 cents	Puzzle, 8 cents
Bean bag, 5 cents	Dishes, 9 cents



Find how much each child pays in the toy store:

1. Alice buys a paper doll and dishes.
2. Robert buys a boat and a horn.
3. Mary buys dominoes and a top.
4. John buys a boat and a whistle.
5. Cora buys dominoes and a whistle.
6. Frank buys a puzzle and a top.
7. Ella buys a bean bag and a horn.
8. James buys a boat and a top.
9. Maud buys two horns.
10. Arthur buys two balls.
11. How much more does a puzzle cost than a horn?
12. What is the difference in price between dominoes and a whistle?
13. How much more must be paid for a set of dishes than for a bean bag?
14. How much more do dominoes cost than a ball?
15. How much more does a set of dishes cost than a boat?
16. Ask questions about any two toys you may choose.

Try to find as many *right answers* as possible in 1 minute:

Add:

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>	<i>h</i>	<i>i</i>	<i>j</i>
1.	$\begin{array}{r} 2 \\ 1 \\ \hline \end{array}$	$\begin{array}{r} 2 \\ 2 \\ \hline \end{array}$	$\begin{array}{r} 1 \\ 1 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ 1 \\ \hline \end{array}$	$\begin{array}{r} 3 \\ 2 \\ \hline \end{array}$	$\begin{array}{r} 3 \\ 1 \\ \hline \end{array}$	$\begin{array}{r} 3 \\ 3 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ 3 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ 1 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ 2 \\ \hline \end{array}$
2.	$\begin{array}{r} 6 \\ 1 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ 2 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ 1 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ 1 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ 1 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ 2 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ 2 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ 2 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ 4 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ 3 \\ \hline \end{array}$
3.	$\begin{array}{r} 5 \\ 4 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ 0 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ 5 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ 0 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ 3 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ 0 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ 0 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ 4 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ 0 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ 3 \\ \hline \end{array}$

Subtract:

4.	$\begin{array}{r} 9 \\ 5 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ 6 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ 4 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ 3 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ 5 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ 3 \\ \hline \end{array}$	$\begin{array}{r} 3 \\ 2 \\ \hline \end{array}$	$\begin{array}{r} 2 \\ 2 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ 5 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ 4 \\ \hline \end{array}$
5.	$\begin{array}{r} 7 \\ 6 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ 7 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ 4 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ 2 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ 3 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ 3 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ 5 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ 3 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ 2 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ 8 \\ \hline \end{array}$
6.	$\begin{array}{r} 8 \\ 4 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ 6 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ 7 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ 2 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ 4 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ 4 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ 7 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ 8 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ 2 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ 3 \\ \hline \end{array}$

What number must be added to the lower number to make the upper number?

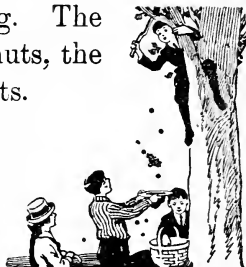
7.	$\begin{array}{r} 8 \\ 2 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ 6 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ 4 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ 2 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ 0 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ 5 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ 5 \\ \hline \end{array}$	$\begin{array}{r} 1 \\ 1 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ 1 \\ \hline \end{array}$	$\begin{array}{r} 3 \\ 0 \\ \hline \end{array}$
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CHAPTER II

READING AND WRITING TENS AND ONES

Read: These children went nutting. The first found 37 nuts, the second, 59 nuts, the third, 60 nuts, and the fourth, 75 nuts.

The figure 0 is called zero. It means **not any**. When placed to the right of 1, as in 10, the figures stand for *ten*; 20 represents *twenty*; 30, *thirty*; 40, *forty*; 50, *fifty*; 60, *sixty*; 70, *seventy*; 80, *eighty*; 90, *ninety*.



The right-hand figure in a number is called **ones'** figure; the second figure is called **tens'** figure. Thus, 14 is 1 *ten* and 4 *ones*; 21 represents *twenty-one*.

1. Read: 14, 25, 48, 59, 64, 70, 91, 40.

2. Read the numbers in each column, beginning at the top; at the bottom.

3. Read the numbers in each row, beginning at the left.

4. Write the numbers having 7 in tens' place; 6; 0; 1; 5; 2; 3; 9; 8; 4.

0	10	20	30	40	50	60	70	80	90
1	11	21	31	41	51	61	71	81	91
2	12	22	32	42	52	62	72	82	92
3	13	23	33	43	53	63	73	83	93
4	14	24	34	44	54	64	74	84	94
5	15	25	35	45	55	65	75	85	95
6	16	26	36	46	56	66	76	86	96
7	17	27	37	47	57	67	77	87	97
8	18	28	38	48	58	68	78	88	98
9	19	29	39	49	59	69	79	89	99

$9 + 2 = 11$	$11 - 9 = 2$	$9 + 3 = 12$	$12 - 9 = 3$
$8 + 3 = 11$	$11 - 8 = 3$	$8 + 4 = 12$	$12 - 8 = 4$
$7 + 4 = 11$	$11 - 7 = 4$	$7 + 5 = 12$	$12 - 7 = 5$
$6 + 5 = 11$	$11 - 6 = 5$	$6 + 6 = 12$	$12 - 6 = 6$

1. Draw dominoes to show all the combinations of two numbers that make 11 and 12. Tell, as on p. 16, what else each domino shows.

Add:

$$\begin{array}{r}
 2 \quad 8 \quad 9 \quad 7 \quad 8 \quad 7 \quad 6 \quad 6 \quad 10 \quad 10 \\
 \underline{9} \quad \underline{3} \quad \underline{3} \quad \underline{4} \quad \underline{4} \quad \underline{5} \quad \underline{5} \quad \underline{6} \quad \underline{2} \quad \underline{1}
 \end{array}$$

Subtract:

$$\begin{array}{r}
 3. \quad 11 \quad 12 \quad 11 \quad 12 \quad 12 \quad 11 \quad 12 \quad 11 \quad 11 \quad 12 \\
 \underline{9} \quad \underline{8} \quad \underline{7} \quad \underline{9} \quad \underline{7} \quad \underline{8} \quad \underline{6} \quad \underline{6} \quad \underline{5} \quad \underline{5}
 \end{array}$$

• • • • • | • • • • • • • • • • | • • • • • | • • • • •

$$4. \quad \frac{1}{2} \text{ of } 12 = ? \qquad \frac{1}{3} \text{ of } 12 = ?$$

5. Edith played 3 games of croquet on Monday and 8 games on Tuesday. How many games did she play both days?

12 things are called a dozen.

6. Our class knitted a dozen sweaters one week and 3 less the second week. How many did we knit the second week?

7. Frank gave a dozen stamps to Clara and David. Clara got $\frac{1}{2}$ of them. How many did David get?

Blind Man's Number Board

NOTE. Players close their eyes and point three times. Touching a line counts 0.

1. Ella's record is 2, 0, 3. Find her score.

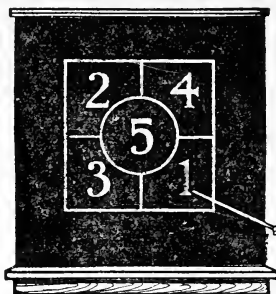
2. Find John's score. His record is 5, 1, 2.

3. What is Ada's score? Her record is 3, 5, 2.

4. Paul's record is 3, 5, 4. Find his score.

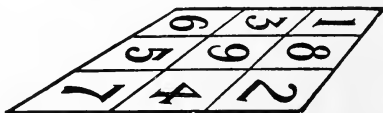
5. What is Maud's score? Her record is 4, 1, 2.

6. Who has won? 7. Who has the lowest score?



Pitching Circles

NOTE. This game is to be played on the playground or at home. Keep a score. Each player pitches three circles. A circle touching any line counts 0.



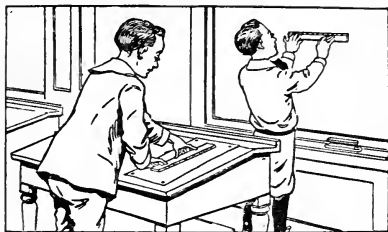
1. Walter's record is 8, 0, 4. Find his score.

2. Ruth's record is 0, 9, 3. Find her score.

3. Robert's record is 6, 4, 1. Find his score.

4. Mary's record is 3, 8, 1. Find her score.

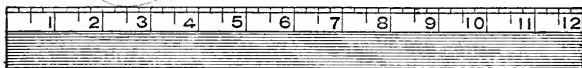
Examine a foot rule. Observe that it is divided into twelve equal spaces. Each space is called one inch.



A foot rule is 12 inches long.

1. Cut from cardboard a foot rule and mark the inches on it.

The following is a picture of a foot rule, although it is *only one fourth the real length*.



2. Count the number of spaces that represent inches.

3. With your rule, draw a line 1 inch long; 4 inches long.

4. John is 3 feet and 6 inches tall. Measure on the wall and show his height.

5. Mark off with the rule on the blackboard a line 1 foot in length; 2 feet in length.

6. Without using the rule, draw a line 1 foot long. Measure it and see whether it is correct.









7. Estimate the length of your desk. Measure it and see whether you are correct.

8. Estimate and then measure the length of other objects.

$3 \text{ feet} = 1 \text{ yard}$

1. Measure a yardstick with your foot rule.
2. One yard is equal to how many feet?
3. Name five things that are sold by the yard.
4. Tell how the storekeeper measures a yard of calico or a yard of ribbon or of lace.
5. Measure with a yardstick and draw a line on the blackboard 1 yard in length; 2 feet in length; 1 foot in length.
6. Measure with a yardstick the length of the classroom. Tell its length in yards and feet.
7. How wide do you think the classroom is? Measure the width and tell whether your answer is correct.
8. Measure the width of the windows; the height of a pupil's desk; the height of the teacher's desk; the width of a door; the distance of a blackboard from the floor.
9. Find the height in feet and inches of the tallest boy in the class.
10. Draw three lines on the blackboard, without measuring them, — the first 1 inch long, the second 1 foot long, and the third, 1 yard long. Test these lines with a yardstick.

1.

							
$1 + 1 = 2$		$2 + 2 = 4$		$3 + 3 = 6$		$4 + 4 = 8$	
2 times 1 = 2		2 times 2 = 4		2 times 3 = 6		2 times 4 = 8	

The sign \times means *times*.

2. Count by 2's to 12.

3. Build the table of 2's as shown at the right.

4. Add the columns and then read them thus:

				2
				2
				2
				2
				2
				2
				2
				2

“One 2 is 2”; “two 2's are 4”; “three 2's are 6”; and so on.

5. Memorize this table:

$2 \times 1 = 2$	$2 \times 4 = 8$	$1 \times 2 = 2$	$4 \times 2 = 8$
$2 \times 2 = 4$	$2 \times 5 = 10$	$2 \times 2 = 4$	$5 \times 2 = 10$
$2 \times 3 = 6$	$2 \times 6 = 12$	$3 \times 2 = 6$	$6 \times 2 = 12$

6. At 2 cents each, find the cost of 2 pencils; 4 pencils; 3 pencils; 6 pencils; 5 pencils.

7. 2×3 splints = — splints. 3×2 splints = — splints.

Notice that $2 \times 3 = 3 \times 2$.

8. 2×4 pins = $4 \times$ — pins.

9. 2×5 eggs = — eggs. 5×2 eggs = — eggs.

10. 2×6 cents = — cents. 6×2 cents = — cents.

11. $2 \times 5 = ?$ $2 \times 3 = ?$ $2 \times 4 = ?$ $2 \times 6 = ?$ $6 \times 2 = ?$

1. What is the cost of three 2-cent stamps? of two 3-cent stamps?

2. Ada bought 2 spools of thread for 5 cents each. How much did both spools cost?

3. Paul's father had 6 cows in each of 2 fields. How many cows did he have?

4. Martha knitted 2 pairs of socks for each of 4 friends. How many pairs of socks did she knit?

5. Anna had 12 towels to iron. When she had ironed $\frac{1}{2}$ of them, how many had she ironed?

6. Mother made 2 cakes of potato flour. She used 4 eggs for each. How many eggs did she use for both cakes?

7. If she had 12 eggs at first, how many were left?

8. Paul gave 2 French stamps to each of 2 friends. How many stamps did he give away?

9. Arthur found 12 eggs in the barn. 7 of the eggs were brown and the others were white. How many white eggs did he find?

10. A hat cost 4 dollars. How much did 2 hats of the same kind cost?

11. How many eggs are $\frac{1}{2}$ dozen eggs?

12. Tell number stories about:

2×6 cents

2×4 errands

$\frac{1}{2}$ of 12 pins

2×2 games

2×5 ships

4×2 frogs

1. Draw dominoes to show all the groups of two numbers, each below 10, whose sum is 13; 14; 15; 16; 17; 18.

2. Tell, as on p. 16, what else each domino shows.

Add:

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>	<i>h</i>	<i>i</i>	<i>j</i>	<i>k</i>	<i>l</i>
3.	9	9	7	9	9	8	8	8	7	8	9	9
	<u>4</u>	<u>5</u>	<u>7</u>	<u>6</u>	<u>7</u>	<u>7</u>	<u>8</u>	<u>6</u>	<u>6</u>	<u>5</u>	<u>8</u>	<u>9</u>

Subtract:

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>	<i>h</i>	<i>i</i>	<i>j</i>
4.	13	14	15	16	17	18	13	15	16	17
	<u>7</u>	<u>8</u>	<u>9</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>9</u>	<u>6</u>	<u>8</u>	<u>9</u>
5.	16	14	13	13	14	15	15	14	14	13
	<u>9</u>	<u>9</u>	<u>6</u>	<u>5</u>	<u>7</u>	<u>8</u>	<u>7</u>	<u>6</u>	<u>5</u>	<u>8</u>

Make problems about each of these numbers: 13, 14, 15, 16, 17, 18. Thus, "Our flag has 7 red stripes and 6 white stripes. How many stripes are there in all?"

Copy and add:

6.	5	2	4	3	2	4	3	4	6	6
	<u>3</u>	<u>3</u>	<u>6</u>	<u>5</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>5</u>	<u>7</u>	<u>5</u>
	2	4	0	3	3	3	6	4	2	4
	<u>3</u>	<u>5</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>5</u>	<u>3</u>	<u>5</u>	<u>3</u>	<u>3</u>
7.	2	3	4	5	6	7	8	9	6	3
	<u>4</u>	<u>5</u>	<u>2</u>	<u>2</u>	<u>0</u>	<u>1</u>	<u>0</u>	<u>0</u>	<u>3</u>	<u>5</u>
	0	1	0	3	2	3	0	2	0	6
	<u>9</u>	<u>8</u>	<u>8</u>	<u>8</u>	<u>5</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>4</u>	<u>4</u>

$$\begin{array}{l|l|l}
 \text{II} & \text{II} & \text{II} \\
 1. \quad 2 + 2 + 2 = 6 & 3 + 3 + 3 = 9 & 4 + 4 + 4 = 12 \\
 3 \times 2 = 6 & 3 \times 3 = 9 & 3 \times 4 = 12
 \end{array}$$

2. How many are $5 + 5 + 5$? 3×5 ? $6 + 6 + 6$? 3×6 ?
3. Count by 3's to 18.
4. Build the table of 3's as you built the table of 2's.
5. Memorize this table:

$3 \times 1 = 3$	$3 \times 4 = 12$	$1 \times 3 = 3$	$4 \times 3 = 12$
$3 \times 2 = 6$	$3 \times 5 = 15$	$2 \times 3 = 6$	$5 \times 3 = 15$
$3 \times 3 = 9$	$3 \times 6 = 18$	$3 \times 3 = 9$	$6 \times 3 = 18$

6. Show with splints three 5's; five 3's.

Notice that $3 \times 5 = 5 \times 3$.

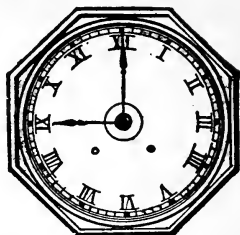
7. $3 \times 2 = 2 \times ?$ $3 \times 4 = 4 \times ?$ $3 \times 6 = 6 \times ?$
8. In a classroom there are 3 rows of girls with 6 girls in each row. How many girls are there?
9. How much do 3 toys cost at 4 cents each?
10. A strip of carpet is 3 yards long. What is its length in feet?
11. How many pencils are there in three packages, each containing 6 pencils?
12. How much do 3 cards cost at 5 cents each?
13. Find with splints the answers to the following:

$3 \times 10 = ?$	$3 \times 7 = ?$	$3 \times 8 = ?$	$3 \times 9 = ?$
$10 \times 3 = ?$	$7 \times 3 = ?$	$8 \times 3 = ?$	$9 \times 3 = ?$

The Romans wrote their numbers with letters.

This is how they wrote the first twelve numbers:

I	II	III	IV	V	VI
1	2	3	4	5	6
VII	VIII	IX	X	XI	XII
7	8	9	10	11	12



1. Find on the clock face the Roman numbers for 6, 8, 1, 9, 3, 2, 7, 5, 10, 12, 11.

On clock faces IIII is used for IV.

2. Read this Mother Goose rime:

When V and I together meet
 They make the number **six** complete.
 When I with V does meet once more
 Then both together make but **four**;
 And when that V from I is gone,
 Alas! poor I can make but **one**.



3. Write the Roman number for 6.

4. Show what change in the letters for 6 will make the Roman number 4.

5. Write the Roman number for 7.

6. Write the Roman number for 9.

7. Read: V, IX, IV, III, VII, X, VI, VIII, XI, XII.

8. Write all the Roman numbers from 1 to 12.

1. Read the number of the chapter that begins on p. 27 of this book ; on p. 81 ; on p. 125 ; on p. 181.

2. Which of the Roman numbers do you sometimes see on a nickel ?

3. What change in the Roman number for 9 will make the Roman number for 11 ?

The short hand on the clock is called the **hour hand**. The long hand is called the **minute hand**.

4. What time is it by the clock in the picture on p. 38 ?

5. Make a clock face of cardboard and place the hands to show nine o'clock.

6. Move the hour hand to ten. What time is it ?

7. Move the hour hand to four. What time is it ?

8. Place the hands to show five o'clock ; two o'clock ; seven o'clock.

9. Show the position of the hands at 30 minutes after 9 ; at 30 minutes after 10 ; at 30 minutes after 11.

10. What time is it when the minute hand is at VI, and the hour hand between I and II ?

11. What time is it when the minute hand is at I and the hour hand just beyond XII ?

12. Tell what time it is when the hour hand is at I and the minute hand at XII.

13. Place the hands to show at what time you got up this morning.

One fourth $\frac{1}{4}$

1. || || || || Count the splints by twos.
2. How many splints are there?
3. Into how many groups are the splints divided?
4. Compare the groups as to the number in each.
5. Each group is called $\frac{1}{4}$ of 8.
6. How many splints are there in $\frac{1}{4}$ of 8 splints?
7.

$\frac{1}{4}$ of 12	$\frac{1}{4}$ of 12	$\frac{1}{4}$ of 12	$\frac{1}{4}$ of 12

 $\frac{1}{4}$ of 12 splints is — splints.
8. What name is given to each group?
9. How many inches are there in $\frac{1}{4}$ of a foot?
10. How many buttons are $\frac{1}{4}$ of a dozen?
11. I divided 12 cents equally among 4 boys. How much did each receive?
12. What is the cost of $\frac{1}{4}$ of a pound of sugar at 8 cents a pound?
13. Margaret found 8 peanuts in a peanut hunt. She ate $\frac{1}{4}$ of them. How many did she eat?
14. Which is greater, $\frac{1}{4}$ of 8 or $\frac{1}{2}$ of 8?
15. Complete: $\frac{1}{4}$ of 8 = ? $\frac{1}{4}$ of 12 = ?

$$\begin{aligned} 2 \text{ pints} &= 1 \text{ quart} \\ 2 \text{ pt.} &= 1 \text{ qt.} \end{aligned}$$

For this exercise use real measures.

1. Fill the pint measure with water and empty it into the quart measure.

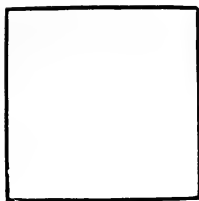
Do this a second time.

You have shown that

2 pints equal 1 quart.



2. A quart is how many times a pint?
3. A pint is what part of a quart?
4. How many times can Mary's mother fill a half-pint milk bottle from the pint measure?
5. Charles gets a pint of milk each morning and evening. How many pints does he get in 2 days?
6. He pays 8 cents for a pint of milk. How much does he pay for a quart?
7. Raymond delivers each day 3 quart bottles of milk. How many pints does he deliver?
8. Henry goes to the store for 2 quarts of oil. How many pints does he get?
9. At 6 cents a pint, how much does a quart cost?



1. How many equal sides has this figure? how many square corners?

The figure is called a **square**.

2. Measure with your rule and tell the length of each side of this square.

3. Draw on paper and cut out several squares of different sizes.

4. What is the distance around a square that measures 2 inches on a side?

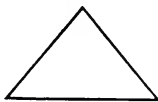
5. What is the distance around a square that measures 3 inches on a side?

6. How does this figure differ from a square? What kind of corners has it? It is called an **oblong**.



7. Draw on paper and cut out several oblongs of different sizes.

8. Draw an oblong 3 inches long and 2 inches wide. What is the distance around it?



9. How many sides has each of these figures? Such a figure is called a **triangle**.

10. Draw three triangles of different sizes on paper and cut them out.

11. What is the shape of a page of this book? of the top of your desk?

12. Tell the shapes of other objects in your school-room.



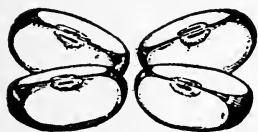
1. Cut an apple into 2 equal parts. What is one part called?

2. Into how many halves can an apple be cut? an orange? a pie?

One half of 1 is written $\frac{1}{2}$.

3. Cut an apple into 3 equal parts. What is 1 part called?

One third of 1 is written $\frac{1}{3}$.



4. Cut an apple into 4 equal parts. Each part is named one fourth or one quarter.

One fourth of 1 is written $\frac{1}{4}$.

5. How many fourths of an apple equal a whole apple?

6. Write in figures: one half; one third; one fourth.

7. Which is greater, $\frac{1}{2}$ of a circle or $\frac{1}{4}$ of the circle?

8. $\frac{1}{2}$ is equal to how many fourths?

9. I divided an apple equally among Grace, Ruth, and Laura. What part of the apple did I give to each?

10. Draw a square and divide it into fourths.

11. If you eat $\frac{1}{2}$ of an apple, what part of the apple is left?

1. || || || || || Count the splints by 2's. How many times must 2 splints be taken to have 10 splints? 10 splints contain 2 splints — times.

Show by separating into twos:

2. 6 contains 2 — times. 8 contains 2 — times. 12 contains 2 — times.

The sign \div means *divided by*.

$4 \div 2$ means 4 *divided by* 2.

3. Read and give the answers:

$$4 \div 2 = ?$$

$$8 \div 2 = ?$$

$$12 \div 2 = ?$$

$$6 \div 2 = ?$$

$$10 \div 2 = ?$$

$$\frac{1}{2} \text{ of } 12 = ?$$

4. At 2 dollars a pair, how many pairs of gloves can be bought for 8 dollars?

5. How many quarts are there in 10 pints of milk?

6. How many 2-cent stamps can you buy for 8 cents?

7. There were 12 eggs in a box. Frank took them out of the box by 2's. How many times did he take out 2 eggs?

8. I have 6 marbles. To how many boys can I give 2 marbles each?

9. 12 boys are marching by 2's. How many boys are there in each file?

10. How many 2's are there in 10? in 4? in 6?

11. How many 2's are there in 8? $8 \div 2 = ?$

1. Memorize this table: *

$2 \times 1 = 2$	$2 \div 2 = 1$	$2 \times 6 = 12$	$12 \div 2 = 6$
$2 \times 2 = 4$	$4 \div 2 = 2$	$2 \times 7 = 14$	$14 \div 2 = 7$
$2 \times 3 = 6$	$6 \div 2 = 3$	$2 \times 8 = 16$	$16 \div 2 = 8$
$2 \times 4 = 8$	$8 \div 2 = 4$	$2 \times 9 = 18$	$18 \div 2 = 9$
$2 \times 5 = 10$	$10 \div 2 = 5$	$2 \times 10 = 20$	$20 \div 2 = 10$

2. 2×8 cents = ? $2 \times \$10 = ?$ 2×6 dolls = ?

3. 2×2 books = ? 2×7 days = ? 5×2 pins = ?

4. 2×4 balls = ? 3×2 cents = ? 2×9 cents = ?

5. How many are three 2's? four 2's? five 2's? six 2's? seven 2's? eight 2's? nine 2's? ten 2's?

6. Divide these numbers by 2 from left to right and from right to left:

12, 18, 2, 6, 16, 10, 20, 8, 4, 14.

7. Copy and write the answers:

$2 \times 7 = ?$ $10 \div 2 = ?$ $16 \div 2 = ?$ $9 \times 2 = ?$

$2 \times 8 = ?$ $2 \times 6 = ?$ $3 \times 2 = ?$ $14 \div 2 = ?$

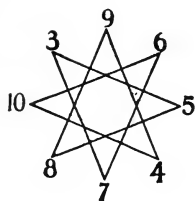
$18 \div 2 = ?$ $7 \times 2 = ?$ $12 \div 2 = ?$ $20 \div 2 = ?$

$8 \div 2 = ?$ $2 \times 10 = ?$ $5 \times 2 = ?$ $10 \times 2 = ?$

$6 \div 2 = ?$ $2 \times 3 = ?$ $2 \times 9 = ?$ $6 \times 2 = ?$

$4 \div 2 = ?$ $2 \times 4 = ?$ $2 \times 5 = ?$ $8 \times 2 = ?$

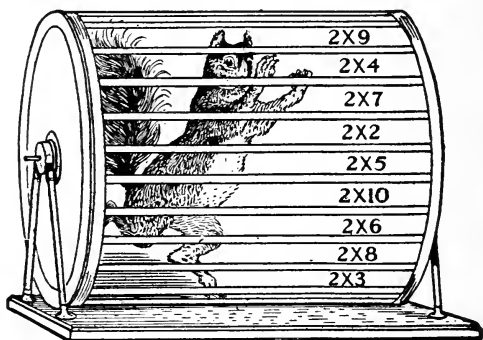
* From this point on, the multiplication tables will be presented in only one form. It is desirable, however, that both forms be taught together, to show that $2 \times 3 = 3 \times 2$, $2 \times 4 = 4 \times 2$, etc.



1. Make problems, using any of the numbers on the points of the star as the cost of one article and find the cost of 2 such articles at the same price.

2. To turn this wheel, the squirrel must find the products, one after another, beginning at the bottom.

If you were the squirrel, how quickly could you turn the wheel?



Memorize this table :

$3 \times 1 = 3$	$3 \div 3 = 1$	$3 \times 6 = 18$	$18 \div 3 = 6$
$3 \times 2 = 6$	$6 \div 3 = 2$	$3 \times 7 = 21$	$21 \div 3 = 7$
$3 \times 3 = 9$	$9 \div 3 = 3$	$3 \times 8 = 24$	$24 \div 3 = 8$
$3 \times 4 = 12$	$12 \div 3 = 4$	$3 \times 9 = 27$	$27 \div 3 = 9$
$3 \times 5 = 15$	$15 \div 3 = 5$	$3 \times 10 = 30$	$30 \div 3 = 10$

3. State the answers :

$3 \times 2 = 2 \times ?$

$3 \times 4 = 4 \times ?$

$8 \times 3 = ?$

$9 \times 3 = ?$

$5 \times 3 = ?$

$10 \times 3 = ?$

1. Count by 3's to 9; to 18.

2. How many times does 6 contain 3? ||| |||

3. Show by separating into groups:

12 contains 3 — times 15 contains 3 — times

18 contains 3 — times 21 contains 3 — times

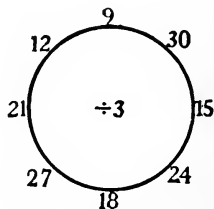
4. State the answers:

$9 \div 3$	$18 \div 3$	$3 \div 3$	$12 \div 3$	$27 \div 3$
$24 \div 3$	$30 \div 3$	$21 \div 3$	$6 \div 3$	$15 \div 3$

5. Divide each number outside the circle by 3.

6. At 3 cents each, how many pencils can be bought for 21 cents?

7. Two dozen plates were arranged 3 in a pile. How many piles of plates were there?



8. Mary put 3 spoons at each place. She used 18 spoons. For how many persons did she set the table?

9. Among how many children could I distribute 15 packages of seeds if I gave 3 packages to each?

10. At 3 dollars a pound, how many pounds of knitting wool can be bought for 27 dollars?

11. How many 3's are there in 30? in 6? in 21?

12. Divide each of these numbers by 3: 27, 18, 15, 21, 9, 3, 12, 6, 24, 30.

1. Multiply each of the following numbers by 3 from left to right and from right to left:

8, 7, 4, 9, 6, 1, 5, 10, 2, 3.

2. Divide each of the following numbers by 3 from left to right and from right to left:

21, 18, 3, 24, 15, 6, 30, 27, 12, 9.

3. Read and state the answers:

$3 \times 6 = ?$

$27 \div 3 = ?$

$3 \times 10 = ?$

$12 \div 3 = ?$

$3 \times 7 = ?$

$21 \div 3 = ?$

$18 \div 3 = ?$

$3 \times 4 = ?$

$3 \times 3 = ?$

$2 \times 3 = ?$

$30 \div 3 = ?$

$15 \div 3 = ?$

$3 \times 5 = ?$

$3 \times 8 = ?$

$6 \div 3 = ?$

$9 \times 3 = ?$

$24 \div 3 = ?$

$6 \times 3 = ?$

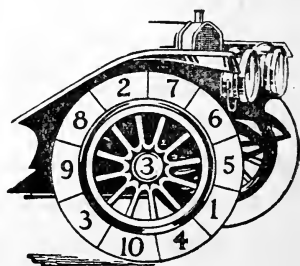
$9 \div 3 = ?$

$3 \div 3 = ?$

$10 \times 3 = ?$

4. Select one of the above statements, as $3 \times 6 = 18$ or $30 \div 3 = 10$, and tell a number story about it.

5. Multiply each number on the tire by the number on the hub and see how quickly you can make this automobile travel.



Secure toy money, or make circles of cardboard to represent the different pieces.

Appoint storekeepers and purchasers, and have the counting done in the schoolroom.

The sign for *cents* is ¢. Thus, 5 *cents* may be written 5¢.

These articles are for sale in a store near a large school.

Pencil, 2 ¢	Kite, 5 ¢
Eraser, 3 ¢	Ball of string, 4 ¢
Top, 5 ¢	Bag of marbles, 5 ¢
Whip, 8 ¢	Pad, 4 ¢
Game, 9 ¢	Whistle, 10 ¢
Ball, 6 ¢	Pen, 3 ¢
Doll, 7 ¢	Ruler, 1 ¢

1. Walter bought a pad. How much change did he get from a dime?

NOTE.—The clerk handed Walter 1¢ and said “5.” Then she handed him a nickel and said “10.” The change was 6¢.

2. Margaret bought an eraser. How much change did she get from a nickel?

3. Ethel bought a pencil. How much change did she get from a dime?

4. George bought a kite, a ball of string, and a bag of marbles. How much did they cost?

5. Make out a price list of articles you wish to buy. Select as many as you could buy for 18 cents.

6. How many pens could you buy for 9 cents?

7. How many pencils could you buy for 20 cents?

8. How many erasers could you buy for 27 cents?

Helen's May Party



1. Helen and her 2 sisters and 3 brothers were invited to a May party. There were 6 other girls and 5 other boys. How many children were there in all?

2. Helen was the queen and marched in front. The other children marched in couples. How many couples were there?

3. Each of the 8 boys brought 3 apples. How many apples did they all bring?

4. Each of 9 girls brought 2 eggs. How many eggs did they all bring?

5. There were 30 ham sandwiches. $\frac{1}{3}$ of them were packed in Peter's box. How many were in his box?

6. Each child received 3 cookies. How many children did 18 cookies supply?

7. How many glasses of lemonade were needed if the girls drank 8 glasses and the boys 9 glasses?

8. The children played 5 games in the morning and 6 games in the afternoon. How many did they play?

9. At one time 9 of the 17 children were dancing around the Maypole and the others were sitting on the grass. How many were sitting on the grass?

Try to find as many *right answers* as possible in 1 minute:

Add:

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>	<i>h</i>	<i>i</i>	<i>j</i>
1.	$\begin{array}{r} 2 \\ 1 \\ 3 \\ 6 \\ \hline \end{array}$	$\begin{array}{r} 3 \\ 2 \\ 5 \\ 4 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ 0 \\ 4 \\ 3 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ 2 \\ 2 \\ 3 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ 1 \\ 3 \\ 2 \\ \hline \end{array}$	$\begin{array}{r} 3 \\ 3 \\ 2 \\ 7 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ 2 \\ 3 \\ 6 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ 0 \\ 2 \\ 7 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ 3 \\ 0 \\ 7 \\ \hline \end{array}$	$\begin{array}{r} 3 \\ 5 \\ 6 \\ 0 \\ \hline \end{array}$

Subtract:

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>	<i>h</i>
2.	$\begin{array}{r} 13 \\ 8 \\ \hline \end{array}$	$\begin{array}{r} 14 \\ 9 \\ \hline \end{array}$	$\begin{array}{r} 18 \\ 9 \\ \hline \end{array}$	$\begin{array}{r} 17 \\ 8 \\ \hline \end{array}$	$\begin{array}{r} 16 \\ 8 \\ \hline \end{array}$	$\begin{array}{r} 15 \\ 8 \\ \hline \end{array}$	$\begin{array}{r} 12 \\ 7 \\ \hline \end{array}$	$\begin{array}{r} 17 \\ 9 \\ \hline \end{array}$
3.	$\begin{array}{r} 16 \\ 9 \\ \hline \end{array}$	$\begin{array}{r} 15 \\ 6 \\ \hline \end{array}$	$\begin{array}{r} 14 \\ 8 \\ \hline \end{array}$	$\begin{array}{r} 15 \\ 7 \\ \hline \end{array}$	$\begin{array}{r} 14 \\ 6 \\ \hline \end{array}$	$\begin{array}{r} 13 \\ 7 \\ \hline \end{array}$	$\begin{array}{r} 12 \\ 5 \\ \hline \end{array}$	$\begin{array}{r} 13 \\ 5 \\ \hline \end{array}$

Find the answers:

	<i>a</i>	<i>b</i>	<i>c</i>
4.	$3 \times 4 = ?$	$9 \times 2 = ?$	$14 \div 2 = ?$
5.	$9 \times 3 = ?$	$3 \times 7 = ?$	$18 \div 2 = ?$
6.	$8 \times 3 = ?$	$3 \times 6 = ?$	$12 \div 3 = ?$
7.	$2 \times 10 = ?$	$18 \div 3 = ?$	$\frac{1}{2}$ of $10 = ?$
8.	$5 \times 3 = ?$	$15 \div 3 = ?$	$\frac{1}{3}$ of $6 = ?$
9.	$10 \times 3 = ?$	$16 \div 2 = ?$	$\frac{1}{4}$ of $8 = ?$
10.	$30 \div 3 = ?$	$27 \div 3 = ?$	$24 \div 3 = ?$
11.	$\frac{1}{2}$ of $8 = ?$	$\frac{1}{3}$ of $9 = ?$	$\frac{1}{4}$ of $12 = ?$
12.	4 qt. = — pt.	2 yd. = — ft.	4 yd. = — ft.

Find how long it takes you to get the *right answers* to each set of five examples.

I

1. $8 + 7 = ?$ $5 + 6 = ?$
2. 2×10 pints = ? pints.
3. — pt. = 1 qt.
4. Count by 5's to 100.
5. $18 - 9 = ?$ $15 - 7 = ?$

II

1. $21 \div 3 = ?$ $27 \div 3 = ?$
2. $3 \times 9 = ?$ $3 \times 10 = ?$
3. — ft. = 1 yd.
4. Count by 10's to 100.
5. $17 - 8 = ?$ $9 + 8 = ?$

III

1. — in. = 1 ft.
2. $20 \div 2 = ?$ $24 \div 3 = ?$
3. Count by 2's from 2 to 36; from 1 to 35.
4. $2 + 3 + 6 = ?$
5. What two numbers added make 9? 10? 11? 12? 13?

IV

1. 6 yd. = ? ft.
2. $3 \times 6 = ?$ $2 \times 9 = ?$
3. Count by 3's from 3 to 30.
4. $30 \div 10 = ?$ $30 \div 3 = ?$
5. What two numbers added make 14? 15? 16? 17? 18?

V

1. $2 + 3 + 5 + 6 = ?$
2. 6 ft. = how many yards?
3. $2 \times 10 = ?$ $2 \times 9 = ?$
4. $8 + 7 = ?$ $9 + 8 = ?$
5. $4 + 4 + 3 = ?$

VI

1. $14 - 5 = ?$ $11 - 7 = ?$
2. 8 qt. = how many pints?
3. $13 - 5 = ?$ $13 + 5 = ?$
4. $9 + ? = 13$; $11 - ? = 7$.
5. $16 - 9 = ?$ $7 + 9 = ?$

CHAPTER III

READING AND WRITING NUMBERS

1. One hundred one is written 101. Write in figures: one hundred four; one hundred seven.

2. The hundreds are written 100, 200, 300, 400, 500, 600, 700, 800, 900.

3. Read: In a poultry yard there were 415 hens which had laid 365 eggs. 240 of these eggs were bought by the grocer.

4. Read; then write from dictation: 109, 110, 308, 315, 506, 348, 836, 941, 707, 888.

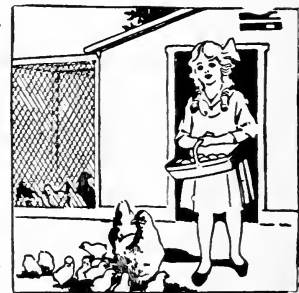
The largest number of three figures is 999. The next number is one thousand, 1000. The first figure on the right is called the *ones'* figure; the next is the *tens'* figure; the next is the *hundreds'* figure; the next is the *thousands'* figure. Thus, 625 is read *6 hundred 25*.

Write in figures:

5. Four hundred two.

6. Four hundred twenty.

7. Six hundred ninety.



8. Seventy-three.

9. Six hundred six.

10. One thousand.

Read ; then write from dictation :

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>
1.	305	542	740	8	70	79	400
	79	67	90	48	84	342	7
	6	500	708	600	395	24	49
	394	9	502	540	4	805	38
2.	562	807	60	536	28	42	62
	39	58	547	69	906	790	203
	645	36	44	25	627	37	636
	834	526	782	981	8	856	93
3.	390	300	29	66	602	90	65
	59	5	330	306	78	68	510
	508	794	57	27	909	80	398
	74	896	18	407	40	399	70
	380	26	901	92	23	76	55
4.	560	683	225	741	809	756	629
	47	999	888	777	666	555	444
	320	758	27	804	98	75	63
	843	431	401	905	229	386	457
	409	254	703	283	118	219	320
5.	403	333	222	111	908	728	354
	721	202	404	505	606	707	808
	82	303	321	329	422	523	624
	975	986	725	937	900	800	700
	64	329	826	848	550	640	230

Add rapidly :



	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>	<i>h</i>	<i>i</i>	<i>j</i>
1.	5	4	3	2	1	9	8	7	6	8
	9	8	6	3	2	0	5	2	7	7
	0	1	2	5	6	2	6	7	9	3
	<u>1</u>	<u>8</u>	<u>0</u>	<u>4</u>	<u>3</u>	<u>6</u>	<u>1</u>	<u>6</u>	<u>8</u>	<u>9</u>
2.	8	3	6	8	5	6	3	8	4	3
	7	6	5	0	5	9	8	1	5	9
	2	5	9	9	8	2	7	3	2	9
	<u>6</u>	<u>9</u>	<u>3</u>	<u>1</u>	<u>0</u>	<u>4</u>	<u>3</u>	<u>7</u>	<u>1</u>	<u>0</u>

3. State the sums :

75	82	94	66	58	49	53	37
<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>

4. Add 3 to each number above instead of 2 ; then 4.

5. Add :

85	66	57	48	42	33	74	99
<u>5</u>	<u>5</u>	<u>5</u>	<u>5</u>	<u>5</u>	<u>5</u>	<u>5</u>	<u>5</u>

6. Add 6 to each number above instead of 5 ; then 7 ; then 8 ; then 9.

Find the sums :

- | | |
|---------------------------|----------------------------|
| 7. 5 apples and 63 apples | 10. 24 boys and 5 boys |
| 8. 7 cakes and 42 cakes | 11. 32 chairs and 6 chairs |
| 9. 81 lemons and 7 lemons | 12. 47 books and 2 books |

1. Add 63 and 9.

63 Write 9 ones under 3 ones and add the ones' column.

$\begin{array}{r} 9 \\ 63 \\ \hline 72 \end{array}$ 9 ones + 3 ones = 12 ones = 1 ten and 2 ones.

Write **2** under ones' column and add 1 to tens' column.

1 ten + 6 tens = 7 tens. Write **7** under tens' column.

The answer is 72.

The process of uniting two or more numbers to form one number is called **addition**.

The answer in addition is called the **sum**.

2. A boy spent 25 cents for a thrift stamp and 8 cents for a badge. How much did he spend for both?

Add:

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>	<i>h</i>
3.	59	49	88	36	47	42	54	48
	<u>3</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>4</u>	<u>9</u>	<u>6</u>	<u>5</u>
4.	27	48	36	59	65	74	82	59
	<u>3</u>	<u>4</u>	<u>5</u>	<u>7</u>	<u>7</u>	<u>6</u>	<u>8</u>	<u>8</u>

5. Memorize the following 45 addition facts:

1	2	2 3	3 4	3 4 5	4 5 6
1, 2	1, 3	2, 1, 4	2, 1, 5	3, 2, 1, 6	3, 2, 1, 7
4 5 6 7		5 6 7 8		5 6 7 8 9	
4, 3, 2, 1, 8		4, 3, 2, 1, 9		5, 4, 3, 2, 1, 10	
6 7 8 9		6 7 8 9		7 8 9	
5, 4, 3, 2, 11		6, 5, 4, 3, 12		6, 5, 4, 13	
7 8 9	8 9	8 9	9	9	
7, 6, 5, 14	7, 6, 15	8, 7, 16	8, 17	9, 18	

Add the two numbers in each oblong. Find how long it takes you to get the *right answers* to each set of five examples. Then work them again and try to improve your speed.

1	5 4	15 4	25 4	35 4	45 4	12	6 4	56 4	66 4	76 4	86 4
2	7 4	17 4	27 4	37 4	47 4	13	8 4	58 4	68 4	78 4	88 4
3	9 4	19 4	29 4	39 4	49 4	14	5 5	55 5	65 5	75 5	85 5
4	6 5	16 5	26 5	36 5	46 5	15	7 5	57 5	67 5	77 5	87 5
5	8 5	18 5	28 5	38 5	48 5	16	9 5	59 5	69 5	79 5	89 5
6	6 6	16 6	26 6	36 6	46 6	17	7 6	57 6	67 6	77 6	87 6
7	8 6	18 6	28 6	38 6	48 6	18	9 6	59 6	69 6	79 6	89 6
8	7 7	17 7	27 7	37 7	47 7	19	8 7	58 7	68 7	78 7	88 7
9	9 7	19 7	29 7	39 7	49 7	20	6 8	56 8	66 8	76 8	86 8
10	7 8	17 8	27 8	37 8	47 8	21	8 8	58 8	68 8	78 8	88 8
11	9 8	19 8	29 8	39 8	49 8	22	9 9	59 9	69 9	79 9	89 9

1. Jean invited 14 girls and 9 boys to her party. How many children did she invite?

2. Frank sold 26 heads of lettuce from his garden on Monday, and 8 heads on Tuesday. How many heads of lettuce did he sell in the two days?

3. John was earning money for a camera. He made 44 cents by selling papers after school and 9 cents on Saturday morning. How much did he make during the week?

4. Doris had 8 cents left after spending 25 cents for a doll's bed. How much money had she at first?

5. How long did it take Philip to go from his home to school, if it took him 7 minutes to walk to the car and he rode for 29 minutes on the car?

6. The gardener planted 9 strawberry plants in one row, 8 in another, and 7 in a third row. How many plants were there in all?

7. Ruth earned 35 cents by weeding the garden and 7 cents by running errands. How much did she earn in all?

8. Four boys were sharpening pencils. One sharpened 5, another 8, another 6, and another 2. How many pencils did they all sharpen?

9. In a school playground there were 18 boys and 9 girls. How many children were there in the playground?

Subtract:

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>	<i>h</i>
1.	$\begin{array}{r} 7 \\ 4 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ 5 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ 2 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ 3 \\ \hline \end{array}$	$\begin{array}{r} 13 \\ 8 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ 4 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ 5 \\ \hline \end{array}$	$\begin{array}{r} 11 \\ 3 \\ \hline \end{array}$
2.	$\begin{array}{r} 13 \\ 6 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ 3 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ 3 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ 7 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ 2 \\ \hline \end{array}$	$\begin{array}{r} 10 \\ 7 \\ \hline \end{array}$	$\begin{array}{r} 12 \\ 4 \\ \hline \end{array}$	$\begin{array}{r} 11 \\ 5 \\ \hline \end{array}$
3.	$\begin{array}{r} 8 \\ 6 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ 8 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ 5 \\ \hline \end{array}$	$\begin{array}{r} 15 \\ 7 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ 4 \\ \hline \end{array}$	$\begin{array}{r} 12 \\ 9 \\ \hline \end{array}$	$\begin{array}{r} 11 \\ 7 \\ \hline \end{array}$	$\begin{array}{r} 17 \\ 9 \\ \hline \end{array}$

What number must be added to the lower number to make the upper number?

4.	$\begin{array}{r} 9 \\ 6 \\ \hline \end{array}$	$\begin{array}{r} 13 \\ 5 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ 5 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ 2 \\ \hline \end{array}$	$\begin{array}{r} 10 \\ 8 \\ \hline \end{array}$	$\begin{array}{r} 12 \\ 7 \\ \hline \end{array}$	$\begin{array}{r} 11 \\ 4 \\ \hline \end{array}$	$\begin{array}{r} 12 \\ 6 \\ \hline \end{array}$
5.	$\begin{array}{r} 13 \\ 9 \\ \hline \end{array}$	$\begin{array}{r} 14 \\ 8 \\ \hline \end{array}$	$\begin{array}{r} 10 \\ 9 \\ \hline \end{array}$	$\begin{array}{r} 12 \\ 2 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ 3 \\ \hline \end{array}$	$\begin{array}{r} 10 \\ 4 \\ \hline \end{array}$	$\begin{array}{r} 11 \\ 8 \\ \hline \end{array}$	$\begin{array}{r} 15 \\ 8 \\ \hline \end{array}$
6.	$\begin{array}{r} 16 \\ 8 \\ \hline \end{array}$	$\begin{array}{r} 15 \\ 9 \\ \hline \end{array}$	$\begin{array}{r} 13 \\ 7 \\ \hline \end{array}$	$\begin{array}{r} 14 \\ 7 \\ \hline \end{array}$	$\begin{array}{r} 15 \\ 6 \\ \hline \end{array}$	$\begin{array}{r} 16 \\ 9 \\ \hline \end{array}$	$\begin{array}{r} 14 \\ 9 \\ \hline \end{array}$	$\begin{array}{r} 11 \\ 6 \\ \hline \end{array}$

Give the answers quickly:

7.	$7 - 6$	$17 - 6$	$27 - 6$	$37 - 6$	$47 - 6$
8.	$13 - 7$	$23 - 7$	$33 - 7$	$43 - 7$	$53 - 7$
9.	$15 - 8$	$25 - 8$	$35 - 8$	$45 - 8$	$55 - 8$
10.	$26 - 9$	$36 - 9$	$46 - 9$	$56 - 9$	$66 - 9$

1. What number must be added to 6 to make 49?

Write the example in this way.

49

Think $6 + 43 = 49$.

6

43

Write **3** in ones' place and **4** in tens' place.

The answer is 43.

Subtract and test:

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>
2.	44	38	56	64	49	65	98
	<u>2</u>	<u>3</u>	<u>3</u>	<u>1</u>	<u>3</u>	<u>2</u>	<u>5</u>

3.	58	65	68	57	69	86	75
	<u>3</u>	<u>1</u>	<u>5</u>	<u>4</u>	<u>4</u>	<u>2</u>	<u>3</u>

4.	77	88	75	96	87	94	89
	<u>4</u>	<u>5</u>	<u>5</u>	<u>6</u>	<u>3</u>	<u>1</u>	<u>9</u>

5.	67¢	59¢	88¢	97¢	76¢	85¢	47¢
	<u>2¢</u>	<u>5¢</u>	<u>6¢</u>	<u>7¢</u>	<u>6¢</u>	<u>4¢</u>	<u>6¢</u>

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>
6.	99 eggs	96 nuts	87 tops	79 pens	98 cups
	<u>8 eggs</u>	<u>4 nuts</u>	<u>4 tops</u>	<u>8 pens</u>	<u>4 cups</u>

7.	89 pads	94 caps	59 bags	97 pins	99 hats
	<u>9 pads</u>	<u>1 cap</u>	<u>8 bags</u>	<u>2 pins</u>	<u>9 hats</u>

8. Make and solve five more examples like those above.

1. David had 14 rabbits and Walter had 4. How many more did David have than Walter?

2. Edna spent 4 cents for pencils. She gave the clerk 25 cents. How much change should she receive?

3. Ada knitted a sweater. She purled 8 inches and knit 38 inches plain. How many more inches were knit plain than purled?

4. Arthur lived 68 miles from the city. After he had gone 4 miles toward the city, how many miles had he still to travel?

5. John drove 29 cows and Peter drove 8 cows. How many more cows were there in John's herd than in Peter's?

6. Clara had 36 pieces in her doll's dinner set, but 5 plates were lost. How many pieces remained?

7. Philip had 76 radishes in his garden and pulled up 4 radishes. How many radishes were left in the garden?

8. William rode 29 miles on his bicycle on Thursday and 8 miles on Friday. How much farther did he ride on Thursday than on Friday?

9. From a class consisting of 37 children, 6 children were absent. How many were present?

10. Make problems about :

pupils	dollars	pictures	lamps	books
46 - 4	37 - 4	63 - 2	48 - 6	73 - 2
56 - 3	68 - 3	84 - 4	46 - 4	39 - 5

1. What number must be added to 5 to make 60?

60 Write the example in this way.

5 Think $5 + 55 = 60$.

The process of finding the difference between two numbers, or finding what must be added to a number to make a given number, is called **subtraction**.

The number from which we subtract is called the **minuend**.

The number subtracted is called the **subtrahend**.

The answer in subtraction is called the **difference** or **remainder**.

Subtract:

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>
2.	60 <u>7</u>	90 <u>3</u>	50 <u>8</u>	40 <u>4</u>	30 <u>9</u>	70 <u>7</u>	80 <u>6</u>
3.	40 <u>2</u>	30 <u>6</u>	50 <u>5</u>	80 <u>9</u>	90 <u>7</u>	60 <u>4</u>	70 <u>8</u>
4.	20 <u>5</u>	70 <u>4</u>	70 <u>3</u>	60 <u>2</u>	70 <u>1</u>	90 <u>9</u>	90 <u>8</u>
5.	50 <u>6</u>	80 <u>7</u>	60 <u>8</u>	50 <u>9</u>	40 <u>5</u>	30 <u>4</u>	20 <u>3</u>

6. Our baseball team played 20 games and lost 9 games. How many did they win?

7. Martha bought 1 yard of ribbon for 8¢ and handed the clerk 50¢. How much change did she get?

8. Make a number story about 90¢ less 5¢.

1. What number must be added to 5 to make 83?

$\begin{array}{r} 83 \\ 5 \end{array}$ Write the example in this way.

$\begin{array}{r} 83 \\ 78 \end{array}$ Think $5 + 78 = 83$.

Subtract:

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>
2.	$\begin{array}{r} 63 \\ 7 \\ \hline \end{array}$	$\begin{array}{r} 92 \\ 9 \\ \hline \end{array}$	$\begin{array}{r} 84 \\ 9 \\ \hline \end{array}$	$\begin{array}{r} 57 \\ 8 \\ \hline \end{array}$	$\begin{array}{r} 85 \\ 9 \\ \hline \end{array}$	$\begin{array}{r} 34 \\ 7 \\ \hline \end{array}$	$\begin{array}{r} 91 \\ 4 \\ \hline \end{array}$
3.	$\begin{array}{r} 48 \\ 9 \\ \hline \end{array}$	$\begin{array}{r} 76 \\ 7 \\ \hline \end{array}$	$\begin{array}{r} 81 \\ 9 \\ \hline \end{array}$	$\begin{array}{r} 63 \\ 4 \\ \hline \end{array}$	$\begin{array}{r} 92 \\ 4 \\ \hline \end{array}$	$\begin{array}{r} 86 \\ 8 \\ \hline \end{array}$	$\begin{array}{r} 84 \\ 5 \\ \hline \end{array}$
4.	$\begin{array}{r} 56 \\ 9 \\ \hline \end{array}$	$\begin{array}{r} 85 \\ 7 \\ \hline \end{array}$	$\begin{array}{r} 31 \\ 8 \\ \hline \end{array}$	$\begin{array}{r} 61 \\ 7 \\ \hline \end{array}$	$\begin{array}{r} 21 \\ 3 \\ \hline \end{array}$	$\begin{array}{r} 34 \\ 6 \\ \hline \end{array}$	$\begin{array}{r} 44 \\ 8 \\ \hline \end{array}$
5.	$\begin{array}{r} 25¢ \\ 8¢ \\ \hline \end{array}$	$\begin{array}{r} 57¢ \\ 7¢ \\ \hline \end{array}$	$\begin{array}{r} 93¢ \\ 5¢ \\ \hline \end{array}$	$\begin{array}{r} 42¢ \\ 6¢ \\ \hline \end{array}$	$\begin{array}{r} 58¢ \\ 9¢ \\ \hline \end{array}$	$\begin{array}{r} 23¢ \\ 6¢ \\ \hline \end{array}$	$\begin{array}{r} 47¢ \\ 9¢ \\ \hline \end{array}$
6.	$\begin{array}{r} 32¢ \\ 5¢ \\ \hline \end{array}$	$\begin{array}{r} 71¢ \\ 2¢ \\ \hline \end{array}$	$\begin{array}{r} 81¢ \\ 5¢ \\ \hline \end{array}$	$\begin{array}{r} 86¢ \\ 6¢ \\ \hline \end{array}$	$\begin{array}{r} 97¢ \\ 8¢ \\ \hline \end{array}$	$\begin{array}{r} 82¢ \\ 8¢ \\ \hline \end{array}$	$\begin{array}{r} 73¢ \\ 9¢ \\ \hline \end{array}$
7.	$\begin{array}{r} 59¢ \\ 8¢ \\ \hline \end{array}$	$\begin{array}{r} 53¢ \\ 6¢ \\ \hline \end{array}$	$\begin{array}{r} 54¢ \\ 5¢ \\ \hline \end{array}$	$\begin{array}{r} 55¢ \\ 8¢ \\ \hline \end{array}$	$\begin{array}{r} 56¢ \\ 7¢ \\ \hline \end{array}$	$\begin{array}{r} 58¢ \\ 9¢ \\ \hline \end{array}$	$\begin{array}{r} 57¢ \\ 8¢ \\ \hline \end{array}$
8.	$\begin{array}{r} 87¢ \\ 9¢ \\ \hline \end{array}$	$\begin{array}{r} 86¢ \\ 9¢ \\ \hline \end{array}$	$\begin{array}{r} 82¢ \\ 7¢ \\ \hline \end{array}$	$\begin{array}{r} 93¢ \\ 6¢ \\ \hline \end{array}$	$\begin{array}{r} 81¢ \\ 8¢ \\ \hline \end{array}$	$\begin{array}{r} 85¢ \\ 6¢ \\ \hline \end{array}$	$\begin{array}{r} 94¢ \\ 8¢ \\ \hline \end{array}$

9. Peter saved 7¢. How much more did he need for a 25-cent ball?

10. Alice counted 36 radishes in her garden one morning. She pulled 9. How many remained?

11. Make a number story about 65¢ less 8¢.

1. It takes 20 stamps to fill a certain card. Walter had 4 stamps. How many more did he need to fill the card?
2. Alice had 33 stitches on her knitting needle and bound off 8 stitches. How many stitches were left?
3. Frank's garden contained 72 radishes. He pulled 9 radishes. How many radishes were left in the garden?
4. Our classroom seats 46 pupils. How many seats were filled when 7 pupils were absent?
5. A farmer had 41 cows. He sold all but 9 cows. How many cows did he sell?
6. Hazel had 63 cents. She paid 5 cents for a stamp. How much money had she left?
7. Katherine bought a box of crayons for 8 cents. How much had she left from 50 cents?
8. A shelf of the school library contained 40 books. How many remained after 6 books were taken away?
9. Philip had 8 stamps in his collection on April 1 and 72 stamps on May 1. How many stamps did he collect during the month?
10. Emily's necklace contained 91 beads. How many beads were left after she had lost 7 beads?
11. James was saving money for a 50-dollar radio set. After he had saved 9 dollars, how much more did he need?

United States money is written in **dollars** and **cents**.

A period (.), named a “**decimal point**,” is placed to the right of dollars. After the point, cents are written in two places. Thus, 5 *dollars* and 25 *cents* is written \$5.25; 5 *cents* is written \$.05; 42 *cents*, \$.42.

1. Read the prices in the first two columns. Write the others with the dollar sign.

Doll, \$.74	Book, \$1.55	Pear, 5¢	Tray, 95¢
Ball, \$.16	Boat, \$2.05	Plum, 2¢	Tie, 48¢
Top, \$.08	Horn, \$.35	Melon, 15¢	Socks, 74¢

Read; then write from dictation:

2. \$3.40	\$ 2.24	\$3.14	\$3.62	\$2.83
3. \$2.61	\$3.36	\$1.35	\$2.05	\$3.57
4. \$2.43	\$3.25	\$9.41	\$7.09	\$5.13
5. \$1.47	\$2.46	\$2.16	\$5.26	\$4.08
6. \$3.46	\$3.05	\$8.49	\$6.11	\$6.03
7. \$1.25	\$2.74	\$2.56	\$2.65	\$4.79

8. \$24 + \$8 = ?

$$\begin{array}{r} \$24 \\ 8 \\ \hline \$32 \end{array}$$

Write the dollar sign only with the first number and with the answer.

9. Copy and add:

\$37	\$42	\$78	\$25
<u>6</u>	<u>9</u>	<u>4</u>	<u>6</u>

10. Copy and subtract:

\$40	\$92	\$53	\$86
<u>6</u>	<u>5</u>	<u>7</u>	<u>4</u>

Write in columns, placing the points under one another.

11. \$4.60, \$3.28, \$.42. 12. \$.53, \$21.40, \$3.75, \$5.

1. Review the table of 2's to 2×10 .

2. Learn: $2 \times 11 = 22$. $2 \times 12 = 24$.

3. How many are two 6's? 2×6 cents = ?

$2 \times 6 = 12$ may also be written in this way:

6
<u>2</u>
12

6 cents
<u>2</u>
12 cents

4. Multiply:

4	8	6	7	12	5	9	11	10	3
<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>

5. How many are two 34's? $2 \times 34 \text{¢} = ?$

34	34¢
<u>34</u>	<u>34¢</u>
68	68¢

6. A short process of finding two 34's is as follows:

Write the 2 under the right-hand figure of the number to be multiplied, which is 34.

$\begin{array}{r} 34 \\ 2 \\ \hline 68 \end{array}$	<i>Ones.</i> Think $2 \times 4 = 8$. Write 8 . <i>Tens.</i> Think $2 \times 3 = 6$. Write 6 . The answer is 68.	$\begin{array}{r} 34 \text{¢} \\ 2 \\ \hline 68 \text{¢} \end{array}$
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Test. $34 + 34 = 68$.

Multiply:

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>
7.	$\begin{array}{r} 23 \\ 2 \\ \hline \end{array}$	$\begin{array}{r} 54 \\ 2 \\ \hline \end{array}$	$\begin{array}{r} 53 \\ 2 \\ \hline \end{array}$	$\begin{array}{r} 64 \\ 2 \\ \hline \end{array}$	$\begin{array}{r} 93 \\ 2 \\ \hline \end{array}$	$\begin{array}{r} 71 \\ 2 \\ \hline \end{array}$
8.	$\begin{array}{r} 42 \text{¢} \\ 2 \\ \hline \end{array}$	$\begin{array}{r} 81 \text{¢} \\ 2 \\ \hline \end{array}$	$\begin{array}{r} 94 \text{ in.} \\ 2 \\ \hline \end{array}$	$\begin{array}{r} 74 \text{ qt.} \\ 2 \\ \hline \end{array}$	$\begin{array}{r} 63 \text{ ft.} \\ 2 \\ \hline \end{array}$	$\begin{array}{r} 53 \text{ yd.} \\ 2 \\ \hline \end{array}$

1. Review the table of 3's to 3×10 .

2. Learn: $3 \times 11 = 33$. $3 \times 12 = 36$.

Multiply rapidly :

3.	7	9	8	6	10	12	11	20	30
	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>

4. Multiply 65 by 3.

$\begin{array}{r} 65 \\ 3 \\ \hline 195 \end{array}$ *Ones.* $3 \times 5 = 15$. Write **5**. Carry or add 1 to the tens.

Tens. $3 \times 6 = 18$; $18 + 1$ (carried) = 19. Write **19**.
The answer is 195.

Think: $3 \times 5 = 15$; $3 \times 6 = 18$; $18 + 1 = 19$.

The result, 195, is called the **product**.

5. Multiply 165 by 3.

$\begin{array}{r} 165 \\ 3 \\ \hline 495 \end{array}$ *Ones.* $3 \times 5 = 15$. Write **5**. Carry 1.
Tens. $3 \times 6 = 18$; $18 + 1 = 19$. Write **9**. Carry 1.
Hundreds. $3 \times 1 = 3$; $3 + 1 = 4$. Write **4**.

The product is 495.

$1 \times 0 = 0$; $2 \times 0 = 0$; $3 \times 0 = 0$. Any number of times $0 = 0$.

Multiply:

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>
6.	40	75	66	74	80
	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>
7.	130	105	216	308	207
	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>
8.	236¢	300 yd.	237 in.	258 ft.	189¢
	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>

1. Philip earned \$24 a month by helping a farmer. How much did he earn in 2 months?

2. Find the cost of 2 rakes at 80¢ each.

3. Mary canned 14 jars of peaches. Her mother canned twice as many jars. How many jars did her mother can?

4. Find the cost of 2 pints of molasses at 14 cents a pint.

Find the cost of:

5. 2 pieces of soap at 10 cents apiece.

6. 2 garden forks at 44 cents each.

7. 2 dozen buttons at 12 cents a dozen.

8. 2 yards of ribbon at 11 cents a yard.

9. How many inches are there in 3 feet?

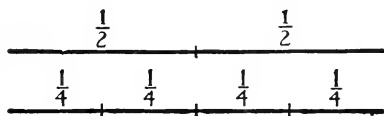
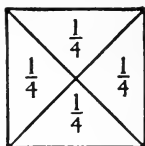
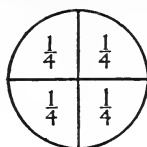
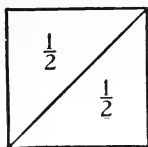
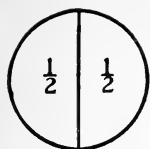
10. An automobile ran 21 miles an hour. How far did it go in 3 hours?

11. Harold bought 3 notebooks at 16 cents each. How much did they cost?

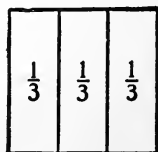
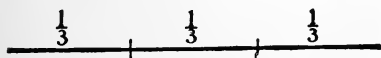
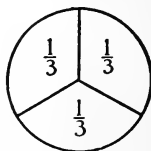
12. Andrew sold 3 dozen eggs at 60 cents a dozen. How much did he receive for them?

13. Find the cost of 3 rugs at 24 dollars each.

14. Three girls bought trowels for their gardens. They cost 15 cents each. How much did the 3 trowels cost?



1. How many halves of a circle are there in a circle?
2. How many halves of a square are there in a square?
3. How many halves of a line are there in a line?
4. How many halves are there in a unit or one of *anything*?
5. How many fourths of a circle are there in a circle? how many fourths of a square in a square? how many fourths of a line in a line?
6. How many fourths are there in a unit or one of *anything*?
7. How many thirds of a circle are there in a circle? how many thirds of a square in a square? how many thirds of a line in a line?
8. How many thirds are there in a unit or one of *anything*?



Measure carefully with your ruler and draw :

1. An envelope 2 inches wide and 4 inches long.
2. A blotter 3 inches wide and 6 inches long.
3. A page 4 inches wide and 6 inches long.
4. A square 3 inches on a side.
5. A square 4 inches on a side.
6. The top of a square box 5 inches on a side.
7. A picture 4 inches by 6 inches.

Let 1 inch stand for 1 foot, and draw figures to represent :

8. A rug 3 feet wide and 8 feet long.

NOTE. As 1 inch stands for 1 foot, 3 inches stand for 3 feet, and 8 inches for 8 feet. Draw an oblong 3 inches wide and 8 inches long.

9. A hallway 4 feet wide and 10 feet long.
10. A table cover 4 feet wide by 7 feet long.
11. A window glass 4 feet by 9 feet.
12. A blackboard 3 feet by 6 feet.

Let 1 inch stand for 1 yard, and draw figures to represent :

13. A room 4 yards by 6 yards.
14. A porch floor 2 yards wide and 8 yards long.
15. A hallway 3 yards wide and 12 yards long.
16. A rug 3 yards wide and 5 yards long.
17. A porch rug 2 yards wide and 4 yards long.
18. A wall 3 yards in height and 6 yards long.

1. How many tens make twenty? One ten is what part of 20?

One half of *twenty* is ten.

One half of *four* is two.

What is one half of *twenty-four*?

$$\begin{array}{l} 2. \qquad \frac{1}{2} \text{ of } 20 = 10 \\ \qquad \frac{1}{2} \text{ of } 6 = 3 \end{array} \left. \vphantom{\begin{array}{l} 2. \\ \frac{1}{2} \text{ of } 20 = 10 \\ \frac{1}{2} \text{ of } 6 = 3 \end{array}} \right\} \frac{1}{2} \text{ of } 26 = 13.$$

3. Find in the same way $\frac{1}{2}$ of 28.

4. How many sevens are twenty-one? One seven is what part of twenty-one? $\frac{1}{3}$ of 21 = 7.

5. How many eights are 24?

One eight is what part of 24? $\frac{1}{3}$ of 24 = 8.

6. How many are three nines?

One nine is what part of 27? $\frac{1}{3}$ of 27 = 9.

7. How many tens are thirty? How much is $\frac{1}{3}$ of 30?

$$\begin{array}{l} \frac{1}{3} \text{ of } 30 = 10 \\ \frac{1}{3} \text{ of } 3 = 1 \end{array} \left. \vphantom{\begin{array}{l} \frac{1}{3} \text{ of } 30 = 10 \\ \frac{1}{3} \text{ of } 3 = 1 \end{array}} \right\} \frac{1}{3} \text{ of } 33 = 11.$$

8. Find $\frac{1}{3}$ of 36 by finding $\frac{1}{3}$ of 30 and $\frac{1}{3}$ of 6.

9. I divided 39 cents equally among 3 boys. How much did each receive?

10. Three girls together made 27 bandages. Each girl made the same number. How many did each make?

11. Mother divided 21 cookies equally among 3 children. How many did each get?

1. Into how many groups of 2 apples each may 10 apples be divided?

10 divided by 2 equals 5 is written $10 \div 2 = 5$, or $2 \overline{)10}$
 $0 \div 1 = 0$; $0 \div 2 = 0$; $0 \div \text{any number} = 0$. 5

Read, and give the answers:

2. $4 \div 2$; $6 \div 2$; $8 \div 2$; $10 \div 2$; $12 \div 2$; $14 \div 2$; $16 \div 2$.

3. $2 \overline{)8}$ $2 \overline{)10}$ $2 \overline{)6}$ $2 \overline{)12}$ $2 \overline{)14}$ $2 \overline{)16}$ $2 \overline{)18}$

4. Divide 24 by 2.

2 is contained in 2, 1 time. Write 1 below
 $2 \overline{)24}$ the 2.
 12 2 is contained in 4, 2 times. Write 2 below
 the 4.

Think:

Tens. 2 in 2, 1 time. Write 1.

Ones. 2 in 4, 2 times. Write 2.

Find the answers:

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>
5.	$2 \overline{)22}$	$2 \overline{)24}$	$2 \overline{)26}$	$2 \overline{)44}$	$2 \overline{)20}$

6.	$2 \overline{)28}$	$2 \overline{)40}$	$2 \overline{)48}$	$2 \overline{)42}$	$2 \overline{)46}$
----	--------------------	--------------------	--------------------	--------------------	--------------------

7.	$2 \overline{)62}$	$2 \overline{)66}$	$2 \overline{)60}$	$2 \overline{)84}$	$2 \overline{)88}$
----	--------------------	--------------------	--------------------	--------------------	--------------------

8. How many quarts are there in 44 pints?

9. Arnold counted 84 eggs by 2's. How many times did he take out 2 eggs?

10. Divide by 2: 244; 462; 684; 240; 408; 800.

1. The answer in division is called the **quotient**.

2. $24¢ \div 3¢$ means that we are to find *how many times* 3 cents is contained in 24 cents.

3 cents is contained 8 times in 24 cents.

$$\begin{array}{r} 3 \cancel{¢} \overline{)24\cancel{¢}} \\ 8 \text{ times} \end{array}$$

Find the quotients:

3. $82 \text{ days} \div 2 \text{ days}$

9. $189 \text{ years} \div 3 \text{ years}$

4. $186 \text{ hours} \div 3 \text{ hours}$

10. $244 \text{ stamps} \div 2 \text{ stamps}$

5. $422 \text{ minutes} \div 2 \text{ minutes}$

11. $664 \text{ cents} \div 2 \text{ cents}$

6. $488 \text{ feet} \div 2 \text{ feet}$

12. $336 \text{ quarts} \div 3 \text{ quarts}$

7. $249 \text{ inches} \div 3 \text{ inches}$

13. $144 \text{ dozen} \div 2 \text{ dozen}$

8. $622 \text{ dollars} \div 2 \text{ dollars}$

14. $428 \text{ pints} \div 2 \text{ pints}$

15. $24¢ \div 3$ means that we are to find *one third* of 24¢; thus, $\frac{1}{3}$ of 24¢ equals 8¢.

$$\begin{array}{r} 3 \overline{)24\cancel{¢}} \\ 8\cancel{¢} \end{array}$$

Find the quotients:

16. $224 \text{ days} \div 2$

24. $844 \text{ dozen} \div 2$

17. $333 \text{ cents} \div 3$

25. $646 \text{ quarts} \div 2$

18. $216 \text{ dollars} \div 3$

26. $969 \text{ pencils} \div 3$

19. $622 \text{ birds} \div 2$

27. $842 \text{ books} \div 2$

20. $326 \text{ inches} \div 2$

28. $936 \text{ hours} \div 3$

21. $219 \text{ hours} \div 3$

29. $288 \text{ pages} \div 2$

22. $444 \text{ beads} \div 2$

30. $428 \text{ pints} \div 2$

23. $468 \text{ minutes} \div 2$

31. $639 \text{ pens} \div 3$

Divide:

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
1.	$3 \overline{)24}$	$3 \overline{)36}$	$3 \overline{)27}$	$3 \overline{)30}$
2.	$3 \overline{)393}$	$3 \overline{)363}$	$3 \overline{)339}$	$3 \overline{)933}$

3. Compare $8 \div 2$ and $\frac{1}{2}$ of 8; $12 \div 2$ and $\frac{1}{2}$ of 12.
 4. Compare $9 \div 3$ and $\frac{1}{3}$ of 9; $12 \div 3$ and $\frac{1}{3}$ of 12.
 5. Compare $24 \div 2$ and $\frac{1}{2}$ of 24; $36 \div 3$ and $\frac{1}{3}$ of 36.
 6. How do you find $\frac{1}{2}$ of any number? $\frac{1}{3}$ of any number?

7. Find $\frac{1}{2}$ of 208 boys. 8. Find $\frac{1}{3}$ of 312 girls.
- | | |
|---|---|
| $\begin{array}{r} 2 \overline{)208} \\ 104 \end{array}$ | $\begin{array}{r} 3 \overline{)312} \\ 104 \end{array}$ |
|---|---|

How many are:

- | <i>a</i> | <i>b</i> | <i>c</i> |
|---------------------------------|------------------------------|-----------------------|
| 9. $\frac{1}{3}$ of 240 men? | $\frac{1}{3}$ of 159 balls? | $\frac{1}{2}$ of 484? |
| 10. $\frac{1}{3}$ of 306 feet? | $\frac{1}{2}$ of 216 plants? | $\frac{1}{3}$ of 927? |
| 11. $\frac{1}{3}$ of 318 yards? | $\frac{1}{3}$ of 324 sheep? | $\frac{1}{2}$ of 806? |
| 12. $\frac{1}{3}$ of 915 books? | $\frac{1}{2}$ of 802 inches? | $\frac{1}{3}$ of 216? |
13. Alice paid 80 cents for 2 watering cans of the same value. How much did each cost?

14. A family bought 48 pints of milk in a month. How many quarts did they buy?

15. How many 2-cent picture postcards can be bought for 64 cents?

16. A boy earned \$88 in 2 months by cleaning automobiles. How much did he earn each month?

17. John had 96 cents. He spent $\frac{1}{3}$ of his money for seeds. How much did the seeds cost?

Hard Tack

3	4	5
3	2	1

2	3	6
5	4	1

6	5	4
2	3	4

6	5	7
3	4	2

8	4	7
2	6	3

6	7	8
5	4	3

6	8	9
7	5	4

8	9	7
6	5	7

5	8	9
7	4	3

EXPLANATION. A set of cards consists of three cards containing numbers whose sums are equal; as, $\begin{smallmatrix} 3 & 4 & 5 \\ 3, & 2, & 1 \end{smallmatrix}$ or $\begin{smallmatrix} 6 & 5 & 4 \\ 2, & 3, & 4 \end{smallmatrix}$. If the class is large, it will be better to divide it into groups of six or eight pupils each, with a separate pack of cards and a leader for each group. The teacher will provide for each group one "Hard Tack" card and enough sets of cards to give each pupil 6 or 9 cards. Each leader will shuffle the cards in his pack and deal them out. (One child in each group will have one card more than the others.) Each child should hold his cards spread out in his hand so that others cannot see them. Each child in turn should draw a card from one neighbor and afterwards permit his other neighbor to draw a card from him; but whenever a child holds a complete set of cards, he should show them and lay them aside.

HARD
TACK

15	16
17	18

The game continues, one child drawing from another until all the cards but "Hard Tack" have been matched. At the end of the game the child holding "Hard Tack" must give all the combinations by addition of two numbers less than ten, which make the numbers on "Hard Tack."

How Do I Know Your Answer?

Select a number less than 10. Add 3 to it.

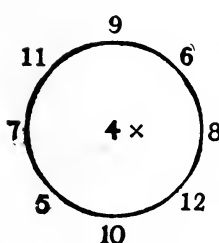
Multiply the sum by 2. Divide the product by 2.

Subtract from the quotient the number that you selected. Your answer is 3.

1. Show by adding four 2's that $4 \times 2 = 8$; show by adding four 3's that $4 \times 3 = 12$, and so on.
2. Count by 4's to 24; to 48.
3. Build the table of 4's as you built the table of 3's.
4. How many are 3 times 4? 4 times 3? How many are 5 times 4? 4 times 5?
5. $6 \times 4 = ?$ $4 \times 6 = ?$ $7 \times 4 = ?$ $4 \times 7 = ?$
6. How many are 12 times 4? 4 times 12?
7. Memorize this table:

$4 \times 1 = 4$	$4 \times 7 = 28$
$4 \times 2 = 8$	$4 \times 8 = 32$
$4 \times 3 = 12$	$4 \times 9 = 36$
$4 \times 4 = 16$	$4 \times 10 = 40$
$4 \times 5 = 20$	$4 \times 11 = 44$
$4 \times 6 = 24$	$4 \times 12 = 48$

8. $4 \times 2 = 2 \times ?$ $4 \times 5 = 5 \times ?$ $4 \times 9 = 9 \times ?$
9. $4 \times 8 = 8 \times ?$ $4 \times 6 = 6 \times ?$ $4 \times 7 = 7 \times ?$

- 
10. Multiply each number outside the circle by 4.
 11. Find the cost of 8 pencils at 4 cents each.
 12. Each of 4 boys earned 10 cents by carrying a bag. How much did they all earn?

13. How many eggs are there in 4 boxes, each of which contains 1 dozen eggs?

1. Give the products rapidly :

8	5	7	9	11	10	4	6	12
<u>4</u>	<u>4</u>	<u>4</u>	<u>4</u>	<u>4</u>	<u>4</u>	<u>4</u>	<u>4</u>	<u>4</u>

2. 4×5 8×4 4×10 4×7 9×4

3. 5×4 4×11 4×3 4×12 4×4

4. 4×2 4×6 6×4 4×9 4×8

5. Agnes had 4 pieces of ribbon of 10 yards each. How many yards had she in all?

6. How far can Thomas walk in 4 hours if he walks 3 miles an hour?

7. At 8 cents a pound how much will 4 pounds of sugar cost?

8. How many days are there in 4 weeks?

Multiply :

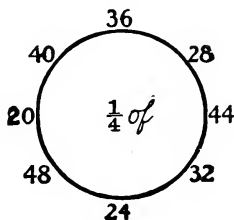
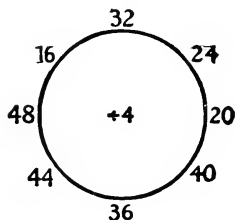
	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>
9.	65	38	23	69	48	56
	<u>4</u>	<u>4</u>	<u>4</u>	<u>4</u>	<u>4</u>	<u>4</u>

10.	93	87	74	75	86	98
	<u>4</u>	<u>4</u>	<u>4</u>	<u>4</u>	<u>4</u>	<u>4</u>

11.	82	60	105	207	190	200
	<u>4</u>	<u>4</u>	<u>4</u>	<u>4</u>	<u>4</u>	<u>4</u>

12.	234	175	208	70	99	160
	<u>4</u>	<u>4</u>	<u>4</u>	<u>4</u>	<u>4</u>	<u>4</u>

1. How many are four 2's? 4 in 8 — times.
2. How many are four 3's? 4 in 12 — times.
3. How many times does 16 contain 4?
4. 20 contains 4 — times; 24 contains 4 — times; 48 contains 4 — times.
5. $32 \div 4 = ?$ $36 \div 4 = ?$ $44 \div 4 = ?$ $48 \div 4 = ?$
6. Give the quotients.
7. Give the parts.



Divide, and test by multiplication :

8. $4 \overline{)44}$ $4 \overline{)48}$ $4 \overline{)844}$ $4 \overline{)804}$ $4 \overline{)404}$
 9. $4 \overline{)248}$ $4 \overline{)328}$ $4 \overline{)400}$ $4 \overline{)448}$ $4 \overline{)436}$

10. Find $\frac{1}{4}$ of each of the following numbers :

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>
244	848	200	408	224
236	836	832	816	220
288	168	240	164	840
440	124	280	204	232

11. There are 824 pages in 4 books. Each book has the same number of pages. How many pages has each book?

Forming Habits of Thrift

1. Our class of 25 pupils each paid 2 cents a week to the Thrift Club. How much did the whole class pay? How much would the class pay at 3 cents a week? at 4 cents a week?

2. At 35 cents a week how much did Arthur save in 4 weeks by staying away from moving pictures?

3. On Monday we collected 4 cents from each of 115 pupils for our school Vacation Club. How much did we collect?

4. Paul and Tom each had 16 cents. Paul saved $\frac{1}{2}$ of his money. How much did Paul save? Tom saved $\frac{1}{4}$ of his money. How much did Tom save?

5. Robert earned 96 cents one week by carrying traveling bags. He saved $\frac{1}{4}$ of it. How much did he save?

6. Edith received \$2, or 200 cents, on her birthday and put $\frac{1}{4}$ of it in the school savings bank. How much did she put in the bank?

7. Ruth stopped buying candy. She saved 4 cents a day for 12 days. How much did she save? How much more did she need to have 50 cents for her bank?

8. John saved 25 cents. How much more did he need for 3 dimes to put in his bank?

9. Helen earned 27 cents one week by washing dishes and 7 cents by running errands. She put 25 cents in the school bank and spent the rest. How much did she spend?

Find how long it takes you to get the *right answers* to each set of five examples.

I

1. $8 + 6 + 4 + 7 = ?$
2. $4 \times 209 = ?$
3. Subtract 7 from 72.
4. Divide 800 by 4.
5. Find $\frac{1}{4}$ of 480.

III

1. $26 - 9 = ?$
2. Divide 168 by 4.
3. Add 4, 6, 8, 7.
4. Find the product of 38 and 4.
5. Draw a rug 3 in. by 2 in., on a scale of 1 ft. to 1 in.

V

1. $4 \times 126 = ?$
2. Find $\frac{1}{4}$ of 128.
3. Take 6 from 82.
4. Find $\frac{1}{2}$ of 486.
5. Divide 915 by 3.

II

1. $\frac{1}{3}$ of 150 = ?
2. $83 - 7 = ?$
3. $3 + 8 + 9 + 7 = ?$
4. Multiply 208 by 4.
5. 8 qt. = ? pt.

IV

1. $248 \div 4 = ?$
2. 1 yd. = ? ft.
3. $3 \times 296 = ?$
4. Find the difference between 91 and 8.
5. Write in words nine hundred eighty-nine.

VI

1. 1 ft. = ? in.
2. $52 - 5 = ?$
3. $3 \times 247 = ?$
4. $47 + 9 = ?$
5. Find $\frac{1}{3}$ of 639.

CHAPTER IV

READING AND WRITING NUMBERS

1. Read: Ida picked 295 daisies.

2. Add 1 to 1000. The sum is one thousand one, written 1001.

3. The thousands are written 1000, 2000, 3000, 4000, 5000, 6000, 7000, 8000, 9000.



Write in figures:

4. One thousand nine.

6. Four thousand eight.

5. Two thousand six.

7. Nine thousand three.

The first figure on the right is called the **ones'** figure; the next is called the **tens'** figure; the next is called the **hundreds'** figure; the next is called the **thousands'** figure. 1625 is read *1 thousand 6 hundred 25*.

8. Read: Our class gathered 8056 daisies.

9. Read; then write: 1025, 2040, 7008, 9456, 8099.

Write as one number:

10. 6 hundreds, 4 tens, 8 ones.

11. 8 thousands, 5 hundreds, 0 tens, 3 ones.

12. 4 thousands, 0 hundreds, 0 tens, 5 ones.

1. Read the following numbers:

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>
4372	7000	4467	5100	3131
1064	2307	9103	23	2030
2007	2510	209	2900	4659
3365	8064	9023	1001	1111

2. Write from dictation:

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
4627	3040	2671	3708
2000	1005	8400	5060
3056	7632	5047	7298
4900	8030	6039	6543

3. Read: In one year my father spent \$ 356.75 for food, \$ 254.50 for rent, and \$ 187.05 for clothing.

4. Read: An airplane made a flight of 5700 miles at the rate of 80 miles an hour. It carried 1200 gallons of gasoline, which was enough for a flight of 16 hours.

5. Write from dictation: 5603 Liberty motors were turned out in October, 1918.

6. Read:

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
\$ 246.25	\$ 632.75	\$ 327.56	\$ 805.96
\$ 318.75	\$ 738.49	\$ 928.89	\$ 613.73
\$ 92.48	\$ 918.86	\$ 738.86	\$ 928.45
\$ 18.64	\$ 29.94	\$ 198.37	\$ 56.91
\$ 178.84	\$ 219.35	\$ 165.27	\$ 214.56
\$ 6.92	\$ 7.29	\$ 86.15	\$ 3.94
\$ 175.49	\$ 216.87	\$ 283.85	\$ 69.47

1. Find the sum of 52 and 27.

$\begin{array}{r} 52 \\ 27 \\ \hline 79 \end{array}$ Write *ones* in *ones'* column and *tens* in *tens'* column. Then add the columns thus:

Ones. $7 + 2 = 9$. Think 9. Write **9**.

Tens. $2 + 5 = 7$. Think 7. Write **7**. The answer is 79.

Test by adding downwards.

Add upwards; test by adding downwards:

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>
2.	$\begin{array}{r} 20 \\ 30 \\ \hline \end{array}$	$\begin{array}{r} 30 \\ 10 \\ \hline \end{array}$	$\begin{array}{r} 40 \\ 10 \\ \hline \end{array}$	$\begin{array}{r} 50 \\ 20 \\ \hline \end{array}$	$\begin{array}{r} 60 \\ 10 \\ \hline \end{array}$	$\begin{array}{r} 30 \\ 40 \\ \hline \end{array}$	$\begin{array}{r} 50 \\ 30 \\ \hline \end{array}$
3.	$\begin{array}{r} 31 \\ 12 \\ \hline \end{array}$	$\begin{array}{r} 21 \\ 32 \\ \hline \end{array}$	$\begin{array}{r} 23 \\ 13 \\ \hline \end{array}$	$\begin{array}{r} 32 \\ 23 \\ \hline \end{array}$	$\begin{array}{r} 12 \\ 33 \\ \hline \end{array}$	$\begin{array}{r} 30 \\ 13 \\ \hline \end{array}$	$\begin{array}{r} 69 \\ 20 \\ \hline \end{array}$
4.	$\begin{array}{r} 32 \\ 16 \\ \hline \end{array}$	$\begin{array}{r} 15 \\ 13 \\ \hline \end{array}$	$\begin{array}{r} 43 \\ 31 \\ \hline \end{array}$	$\begin{array}{r} 67 \\ 11 \\ \hline \end{array}$	$\begin{array}{r} 83 \\ 11 \\ \hline \end{array}$	$\begin{array}{r} 65 \\ 22 \\ \hline \end{array}$	$\begin{array}{r} 62 \\ 30 \\ \hline \end{array}$
5.	$\begin{array}{r} \$45 \\ 14 \\ \hline \end{array}$	$\begin{array}{r} \$25 \\ 33 \\ \hline \end{array}$	$\begin{array}{r} \$35 \\ 54 \\ \hline \end{array}$	$\begin{array}{r} \$34 \\ 35 \\ \hline \end{array}$	$\begin{array}{r} \$42 \\ 45 \\ \hline \end{array}$	$\begin{array}{r} \$55 \\ 33 \\ \hline \end{array}$	$\begin{array}{r} \$44 \\ 22 \\ \hline \end{array}$
6.	$\begin{array}{r} 45¢ \\ 20¢ \\ \hline \end{array}$	$\begin{array}{r} 71¢ \\ 13¢ \\ \hline \end{array}$	$\begin{array}{r} 47¢ \\ 31¢ \\ \hline \end{array}$	$\begin{array}{r} 76¢ \\ 10¢ \\ \hline \end{array}$	$\begin{array}{r} 38¢ \\ 40¢ \\ \hline \end{array}$	$\begin{array}{r} 38¢ \\ 20¢ \\ \hline \end{array}$	$\begin{array}{r} 29¢ \\ 50¢ \\ \hline \end{array}$

Only numbers having **like names** can be added or subtracted.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>
7.	$\begin{array}{r} 17 \text{ boys} \\ 12 \text{ boys} \\ \hline \end{array}$	$\begin{array}{r} 36 \text{ caps} \\ 21 \text{ caps} \\ \hline \end{array}$	$\begin{array}{r} 56 \text{ balls} \\ 32 \text{ balls} \\ \hline \end{array}$	$\begin{array}{r} 35¢ \\ 24¢ \\ \hline \end{array}$	$\begin{array}{r} 46 \text{ ft.} \\ 22 \text{ ft.} \\ \hline \end{array}$

1. Add 38 and 24.

38 *Ones.* Think 12. Write **2**. *Carry 1 to tens'*
24 column.

62 *Tens.* Think 3, 6. Write **6**.

The answer is 62.

Add and test:

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>
2.	<u>36</u> 25	<u>47</u> 24	<u>42</u> 39	<u>54</u> 36	<u>48</u> 34	<u>35</u> 27	<u>64</u> 28
3.	<u>46</u> 36	<u>19</u> 24	<u>29</u> 10	<u>18</u> 36	<u>38</u> 17	<u>17</u> 46	<u>39</u> 45
4.	<u>19</u> 14 3	<u>21</u> 19 12	<u>32</u> + 4 16	<u>23</u> 15 6	<u>31</u> 43 8	<u>42</u> 16 17	<u>13</u> 46 18
5.	<u>11</u> 31 29	<u>16</u> 10 49	<u>19</u> 20 17	<u>41</u> 23 18	<u>39</u> 20 18	<u>42</u> 18 20	<u>15</u> 41 38
6.	<u>30</u> 17 28	<u>40</u> 19 34	<u>32</u> 30 9	<u>9</u> 14 16	<u>8</u> 20 9	<u>15</u> 20 38	<u>13</u> 68 14

NOTE TO THE TEACHER. To save the labor of copying, the pupils may occasionally be directed to write their answers on a sheet of paper placed beneath a row of examples. Copying should not be entirely neglected, however, since the habit of carefulness in copying is an important element in accuracy.

1. Richard made \$24 on his school garden and earned \$17 by washing automobiles. How much money did he earn in all?

2. A farmer sold 26 bushels of apples on Monday, 35 bushels on Tuesday, and 30 bushels on Wednesday. How many bushels did he sell in the three days?

3. On Tuesday a newsboy sold 28 morning papers and 44 evening papers. How many papers did he sell on that day?

4. Dora had 42 cents left after spending 28 cents for buttons and 10 cents for pins. How much money had she at first?

5. One month my father spent \$24 for rent, \$65 for food, and \$12 for other items. How much did all cost?

6. John planted 29 potatoes in one row, 31 in another row, and 33 in a third row. How many potatoes did he plant?

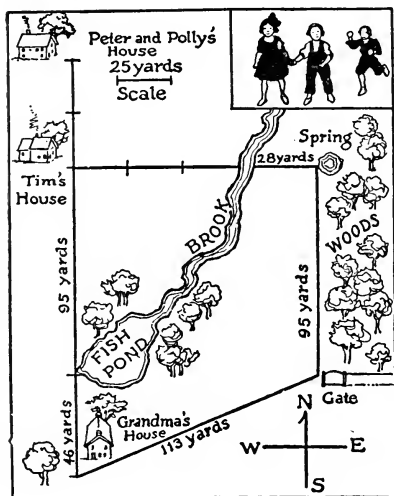
7. Paul spent 35¢ for a ball, 25¢ for a bat, and 10¢ for car fare. How much did he spend?

8. On a picnic each girl spent 15¢ for car fare, 20¢ on the roller coaster, 35¢ in the picture gallery, and 12¢ for popcorn. How much did each girl spend?

9. It took Mary 16 minutes to sweep and dust the library, 12 minutes for the dining room, and 23 minutes for the parlor. How long did it take for the three rooms?

10. Agnes canned 43 jars of fruit and Martha canned 27 jars more than Agnes. How many jars did both can?

Peter and Polly's Country Walk



1. Peter and Polly start out for a walk. They stop for Tim. How far is it to Tim's house, if each line — stands for 25 yards?

2. How far is it from Tim's house to the brook?

3. They walk 28 yards further east to the spring. How far is it from Tim's house to the spring?

4. From the spring they walk 95 yards south through the woods. Then they cut across lots 113 yards from the gate and reach grandma's house. How far do they walk from the spring to grandma's house?

5. The distance north from grandma's house to the fish pond is 46 yards; from the fish pond to Tim's house, 95 yards; and from Tim's house to Peter's house, 50 yards. How far is it from grandma's to Peter's house?

6. How much farther is it from Tim's house to grandma's than from Peter's house to Tim's?

7. What is the total length in yards of Peter and Polly's walk by the time they reach home? What is the total length in feet?

1. Tell rapidly how much must be added to the lower number to make the upper number.

14 9	9 5	13 8	12 7	13 4	16 7	16 8	10 5	15 7
11 2	13 7	17 8	15 9	7 5	14 6	13 5	10 8	10 3
11 3	12 9	11 8	10 7	18 9	9 3	11 6	15 8	11 7
12 3	14 7	14 5	10 4	12 4	17 9	12 6	10 9	13 9
11 5	15 6	11 4	16 9	14 8	12 5	12 8	10 6	13 6

Subtraction by Endings

2. Subtract rapidly :

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
11 - 2 = ?	10 - 9 = ?	17 - 8 = ?	13 - 7 = ?
21 - 2 = ?	30 - 9 = ?	27 - 8 = ?	33 - 7 = ?
41 - 2 = ?	40 - 9 = ?	37 - 8 = ?	43 - 7 = ?
31 - 2 = ?	60 - 9 = ?	57 - 8 = ?	53 - 7 = ?
71 - 2 = ?	70 - 9 = ?	77 - 8 = ?	83 - 7 = ?
<i>e</i>	<i>f</i>	<i>g</i>	<i>h</i>
12 - 8 = ?	13 - 5 = ?	13 - 9 = ?	12 - 7 = ?
32 - 8 = ?	23 - 5 = ?	63 - 9 = ?	22 - 7 = ?
42 - 8 = ?	83 - 5 = ?	43 - 9 = ?	42 - 7 = ?
82 - 8 = ?	33 - 5 = ?	83 - 9 = ?	62 - 7 = ?
62 - 8 = ?	93 - 5 = ?	73 - 9 = ?	52 - 7 = ?

1. Subtract 24 from 59.

59 Write the smaller number under the larger
 $\frac{24}{35}$ number with *ones* under *ones* and *tens* under *tens*.

FIRST METHOD *

Think :

Ones. $4 + 5 = 9$. Write **5**.

Tens. $2 + 3 = 5$. Write **3**.

Test. $35 + 24 = 59$.

SECOND METHOD *

Think :

Ones. $9 - 4 = 5$. Write **5**.

Tens. $5 - 2 = 3$. Write **3**.

Subtract and test :

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>
2.	$\begin{array}{r} 44 \\ 22 \\ \hline \end{array}$	$\begin{array}{r} 38 \\ 13 \\ \hline \end{array}$	$\begin{array}{r} 56 \\ 13 \\ \hline \end{array}$	$\begin{array}{r} 64 \\ 21 \\ \hline \end{array}$	$\begin{array}{r} 49 \\ 23 \\ \hline \end{array}$	$\begin{array}{r} 65 \\ 32 \\ \hline \end{array}$	$\begin{array}{r} 45 \\ 23 \\ \hline \end{array}$
3.	$\begin{array}{r} 58 \\ 33 \\ \hline \end{array}$	$\begin{array}{r} 65 \\ 41 \\ \hline \end{array}$	$\begin{array}{r} 68 \\ 15 \\ \hline \end{array}$	$\begin{array}{r} 57 \\ 24 \\ \hline \end{array}$	$\begin{array}{r} 69 \\ 34 \\ \hline \end{array}$	$\begin{array}{r} 86 \\ 42 \\ \hline \end{array}$	$\begin{array}{r} 77 \\ 33 \\ \hline \end{array}$
4.	$\begin{array}{r} 77 \\ 44 \\ \hline \end{array}$	$\begin{array}{r} 88 \\ 55 \\ \hline \end{array}$	$\begin{array}{r} 75 \\ 25 \\ \hline \end{array}$	$\begin{array}{r} 96 \\ 46 \\ \hline \end{array}$	$\begin{array}{r} 87 \\ 53 \\ \hline \end{array}$	$\begin{array}{r} 94 \\ 41 \\ \hline \end{array}$	$\begin{array}{r} 52 \\ 40 \\ \hline \end{array}$
5.	$\begin{array}{r} 67 \\ 52 \\ \hline \end{array}$	$\begin{array}{r} 59 \\ 45 \\ \hline \end{array}$	$\begin{array}{r} 88 \\ 56 \\ \hline \end{array}$	$\begin{array}{r} 97 \\ 27 \\ \hline \end{array}$	$\begin{array}{r} 76 \\ 36 \\ \hline \end{array}$	$\begin{array}{r} 85 \\ 64 \\ \hline \end{array}$	$\begin{array}{r} 34 \\ 30 \\ \hline \end{array}$
6.	$\begin{array}{r} 99 \\ 38 \\ \hline \end{array}$	$\begin{array}{r} 96 \\ 74 \\ \hline \end{array}$	$\begin{array}{r} 87 \\ 64 \\ \hline \end{array}$	$\begin{array}{r} 79 \\ 38 \\ \hline \end{array}$	$\begin{array}{r} 98 \\ 84 \\ \hline \end{array}$	$\begin{array}{r} 77 \\ 63 \\ \hline \end{array}$	$\begin{array}{r} 59 \\ 50 \\ \hline \end{array}$

* TO THE TEACHER. The first method (called the **addition method**) should be taught for *mental work*, since it is always used in making **change**. For *written work*, the teacher should select the method she prefers; but should under no circumstances teach both methods.

1. John helped a farmer 14 hours one week ; Paul helped 12 hours less. How many hours did Paul work ?

2. Ruth spent 30 cents for knitting needles. She gave the clerk 50 cents. How much change should she receive ?

3. A boy sold 43 newspapers one day, and 67 the next day. How many more did he sell the second day than the first day ?

4. After Paul had walked 24 miles, how many more miles did he have to go to complete 68 miles ?

5. Frank raised 78 lettuce plants and John raised 56 plants. How many more plants did Frank raise than John ?

6. Our class knitted 78 pairs of socks. 36 pairs were white and the rest were gray. How many pairs of gray socks were knitted ?

7. Mr. Burton's farm contained 76 acres of land. He had 14 acres more than his neighbor. How many acres were there in his neighbor's farm ?

8. James rode 27 miles on his bicycle one day and 14 miles the next day. How much farther did he ride the first day than the second ?

9. Make problems about :

children	birds	games	dollars	cents
46 - 14	37 - 24	63 - 12	48 - 36	73 - 21
56 - 43	62 - 31	84 - 21	40 - 24	36 - 15

10. There were 34 children in Miss Bell's class. How many of them were absent, if only 22 were present ?

1. From 80 subtract 27.

	7 10	
80 = 8 tens + 0 ones, or 7 tens + 10 ones	8 0	
27 =	2 tens + 7 ones	2 7
53 =	5 tens + 3 ones	5 3

As you cannot take 7 from 0, think of 80 as 70 + 10. Then subtract 7 ones from 10 ones and 2 tens from 7 tens.

FIRST METHOD *

Think :

Ones. 7 + 3 = 10. Write 3.

Tens. 2 + 5 = 7. Write 5.

SECOND METHOD *

Think :

Ones. 10 - 7 = 3. Write 3.

Tens. 7 - 2 = 5. Write 5.

Test. 53 + 27 = 80.

Subtract, and test each result :

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>
2.	40	60	20	30	50	70	90
	<u>25</u>	<u>32</u>	<u>11</u>	<u>6</u>	<u>28</u>	<u>29</u>	<u>45</u>
3.	30	40	80	70	50	60	80
	<u>23</u>	<u>17</u>	<u>38</u>	<u>26</u>	<u>42</u>	<u>27</u>	<u>9</u>
4.	90	70	80	60	40	20	50
	<u>28</u>	<u>43</u>	<u>24</u>	<u>58</u>	<u>16</u>	<u>8</u>	<u>23</u>

5. Father paid \$18 deposit on a \$50 coat. How much more must he pay?

6. George had 40¢ and paid 25¢ for a cap. How much had he left?

* See Note, page 88.

1. From 83 subtract 35.

	7 13	
83 = 8 tens + 3 ones, or 7 tens + 13 ones	8 3	
35 =	3 tens + 5 ones	3 5
48 =	4 tens + 8 ones	4 8

FIRST METHOD

Think :

Ones. 5 + 8 = 13. Write 8.

Tens. 3 + 4 = 7. Write 4.

Test. 48 + 35 = 83.

SECOND METHOD

Think :

Ones. 13 - 5 = 8. Write 8.

Tens. 7 - 3 = 4. Write 4.

Subtract, and test each result :

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>
2.	63	92	84	57	55	34	91
	<u>27</u>	<u>69</u>	<u>39</u>	<u>38</u>	<u>19</u>	<u>17</u>	<u>54</u>
3.	48	81	81	63	92	86	84
	<u>29</u>	<u>27</u>	<u>29</u>	<u>44</u>	<u>74</u>	<u>58</u>	<u>45</u>
4.	55	93	52	53	67	92	54
	<u>26</u>	<u>75</u>	<u>27</u>	<u>49</u>	<u>49</u>	<u>46</u>	<u>38</u>
5.	54	42	31	65	91	43	22
	<u>36</u>	<u>28</u>	<u>25</u>	<u>58</u>	<u>78</u>	<u>38</u>	<u>13</u>
6.	88	93	45	21	72	56	46
	<u>59</u>	<u>86</u>	<u>37</u>	<u>16</u>	<u>25</u>	<u>39</u>	<u>27</u>

7. Philip had 92¢ in his bank. He took out 57¢ to pay for a bat. How much had he left?

8. Mother made 45 jars of jelly. All but 26 jars were grape jelly. How many jars of grape jelly were there?

Subtract, and test each result:

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>
1.	37 <u>29</u>	46 <u>38</u>	52 <u>39</u>	45 <u>38</u>	50 <u>42</u>	75 <u>38</u>	55 <u>46</u>
2.	47¢ <u>28¢</u>	90¢ <u>27¢</u>	67¢ <u>18¢</u>	91¢ <u>38¢</u>	63¢ <u>17¢</u>	91¢ <u>75¢</u>	82¢ <u>49¢</u>
3.	57¢ <u>29¢</u>	45¢ <u>29¢</u>	23¢ <u>18¢</u>	54¢ <u>37¢</u>	46¢ <u>39¢</u>	72¢ <u>49¢</u>	50¢ <u>38¢</u>
4.	47¢ <u>29¢</u>	33¢ <u>19¢</u>	71¢ <u>19¢</u>	66¢ <u>28¢</u>	43¢ <u>39¢</u>	66¢ <u>19¢</u>	60¢ <u>49¢</u>

5. John bought a penknife at a sale, marked down from 80¢ to 38¢. How much did he save?

6. Mary picked 63 quarts of strawberries and donated 36 quarts to a Red Cross sale. How many quarts did she have left?

7. John sold 83 quarts of milk in May and 58 quarts in June. How many more quarts did he sell in May than in June?

8. In a school there were 32 girls and 19 boys. How many more girls than boys were there in the school?

9. John read 91 pages in his story book and Mary read 76 pages in hers. How many more pages did John read than Mary?

10. On flag day Susan counted 93 flags on one street and Ellen 49 flags on another street. How many more flags did Susan count than Ellen?

1. Mother paid 40¢ for a pound of butter, 32¢ for a pound of coffee, and 14¢ for a quart of milk. How much did she pay for the three articles?
2. How much money had she left from 90¢?
3. Find the total cost of a pair of socks for 98¢, a cap for 75¢, and a pair of gloves for 85¢.
4. Charles bought a dozen lemons for 35¢. How much change did he get from 50¢?
5. Katherine put the following coins into her bank: a dime, a cent, a nickel, a quarter, and a half dollar. How much money did she put into her bank?
6. Harold bought a paint box for 69¢ and a painting book for 12¢. What was the total cost?
7. John had a school garden. In the spring he paid 15¢ for seed. In the summer he sold radishes for which he received in all 92¢. How much did he gain?
8. A man owed a bill of \$45. He paid \$27. How much then remained to be paid?
9. Lucy and Mary together earned 90¢ by weeding a vegetable garden. Mary earned 43¢. How much did Lucy earn?
10. Thomas bought a book for 80¢, and sold it for 55¢. How much did he lose?
11. Find the cost of a penknife for 50¢, a dozen pencils for 25¢, and a pencil sharpener for 8¢.

1. Divide 72 by 3.

$3 \overline{)72}$ $7 \div 3 = 2$ with 1 remaining. Write **2** under 7.
 $\underline{24}$ As the remainder is 1 *ten* add 10 to the next figure, 2; $10 + 2 = 12$; $12 \div 3 = 4$. Write **4** under 2.

Think: *Tens.* 3 in 7, **2**, with 1 remaining. Write **2**.
Ones. 3 in 12, **4**. Write **4**.

Test. $3 \times 24 = 72$, the dividend.

2. Divide 714 by 3.

Think:

$3 \overline{)714}$ *Hundreds.* 3 in 7, **2**, with 1 remaining.
 $\underline{238}$ Write **2**.
Tens. 3 in 11, **3**, with 2 remaining. Write **3**.
Ones. 3 in 24, **8**. Write **8**.

Divide by 2 and test:

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	
3. 34	90	472	700	364	6. $3 \overline{)315}$ $\underline{105}$
4. 56	30	694	906	588	7. $4 \overline{)416}$ $\underline{104}$
5. 78	58	256	502	752	

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
8. $3 \overline{)726}$	$4 \overline{)892}$	$2 \overline{)910}$	$3 \overline{)750}$
9. $3 \overline{)384}$	$4 \overline{)916}$	$2 \overline{)538}$	$4 \overline{)900}$

10. $\frac{1}{3}$ of 540 men = ? $\frac{1}{3}$ of 171 balls = ? $\frac{1}{2}$ of 748 = ?

1. Walter had 48 baskets of fruit. He sold an equal number to each of 4 different buyers. How many baskets did each buy?

4)48, Number of baskets.
 12, Number of baskets to each. $\frac{1}{4}$ of 48 baskets = 12 baskets.

2. Mary had 45 cents. How many 3-cent oranges could she buy with her money?

3¢)45¢ 3¢ = cost of 1 orange;
 15 45¢ ÷ 3¢ = 15, the number of oranges.

3. A man divided \$375 equally among 3 charities. How much did each receive?

4. Mr. Bell earned \$396 in 3 months. What were his monthly wages?

5. Find the cost of 1 bushel of wheat, if 4 bushels cost 800 cents.

6. If a girl sewed 4 buttons on each pair of gloves, how many pairs were finished when she had used 468 buttons?

7. A farmer having 96 hogs sold one third of them. How many did he sell?

8. In a car containing 639 baskets of peaches, one third were spoiled. How many baskets were spoiled?

9. How many pound boxes can be filled from 164 quarter pounds of tea?

10. When molding costs 15¢ a yard, how much will 1 foot of it cost?

1 ft. = $\frac{1}{3}$ of a yard; 1 ft. will cost $\frac{1}{3}$ of 15¢, or 5¢.

1. Show by adding five 2's that $5 \times 2 = 10$; show by adding five 3's that $5 \times 3 = 15$, and so on.

2. Count by 5's to 20; to 60.

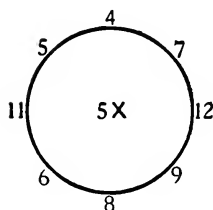
3. Build the table of 5's as you built the table of 4's

4. How many are 5×4 ? 4×5 ? 5×6 ? 6×5 ?

5. How many are 5×7 ? 7×5 ? 5×8 ? 8×5 ?

5×9 ? 9×5 ? 5×10 ? 10×5 ?

5×11 ? 11×5 ? 5×12 ? 12×5 ?



6. Multiply each of the outside numbers by 5. Change the number within the circle to 4 and multiply; then to 3; to 2.

7. Memorize this table:

$5 \times 1 = 5$	$5 \times 7 = 35$
$5 \times 2 = 10$	$5 \times 8 = 40$
$5 \times 3 = 15$	$5 \times 9 = 45$
$5 \times 4 = 20$	$5 \times 10 = 50$
$5 \times 5 = 25$	$5 \times 11 = 55$
$5 \times 6 = 30$	$5 \times 12 = 60$

8. $2 \times 5 = ?$	5 is ? of 10
$4 \times ? = 20$? is $\frac{1}{5}$ of 20
$5 \times 5 = ?$	25 is ? $\times 5$
$? \times 5 = 35$? is $\frac{1}{5}$ of 35
$9 \times ? = 45$	$\frac{1}{5}$ of 45 is ?

9. Give the products:

8×5 boys; 9×5 birds; 5×5 cents; 12×5 girls

10. Compare:

$3 \times \$5$ and $5 \times \$3$

7×5 hats and 5×7 hats

$9 \times \$5$ and $5 \times \$9$

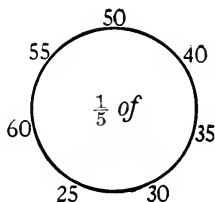
12×5 pins and 5×12 pins

1. Count by 5's to 15; to 25; to 45; to 50; to 60.

2. $? \times 5 = 15$ $? \times 5 = 20$ $? \times 5 = 40$

3. Give the answers rapidly :

$5 \div 5$	$15 \div 5$	$50 \div 5$	$45 \div 5$
$30 \div 5$	$40 \div 5$	$35 \div 5$	$10 \div 5$
$55 \div 5$	$60 \div 5$	$25 \div 5$	$20 \div 5$



4. $\begin{array}{r} 5 \overline{)525} \\ 105 \end{array}$ $\begin{array}{r} 5 \overline{)905} \\ 181 \end{array}$ $\begin{array}{r} 5 \overline{)600} \\ 120 \end{array}$ $\begin{array}{r} 5 \overline{)6005} \\ 1201 \end{array}$

5. Divide 14 by 5 :

$\begin{array}{r} 5 \overline{)14} \\ 2; \text{r. } 4 \end{array}$ $14 \div 5 = 2$, with a *remainder* of 4, since $2 \times 5 = 10$
and $14 - 10 = 4$. Write the abbreviation *r.* for
remainder.

Divide by 5 and give the remainders :

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>
6.	16	17	46	33	18	38	21
7.	32	26	37	27	34	36	41
8.	24	29	23	19	44	39	49

9. Find $\frac{1}{5}$ of: 420 men; 375 hr.; \$415; 870¢.

Divide and test :

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>
10.	$5 \overline{)4225}$	$5 \overline{)7085}$	$5 \overline{)9275}$	$5 \overline{)4375}$	$5 \overline{)8450}$
11.	$5 \overline{)5690}$	$5 \overline{)4280}$	$5 \overline{)1365}$	$5 \overline{)7000}$	$5 \overline{)7005}$
12.	$5 \overline{)7025}$	$5 \overline{)9040}$	$5 \overline{)2750}$	$5 \overline{)4200}$	$5 \overline{)2005}$

1. Show by adding six 2's that $6 \times 2 = 12$; show by adding six 3's that $6 \times 3 = 18$; and so on.

2. Count by 6's to 12; to 24; to 48; to 60; to 72.

3. Build the table of 6's as you built the table of 5's.

4. Our flag has one star for each state. How many states are there? $6 \times 8 = ?$



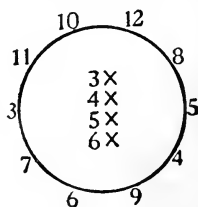
5. Memorize this table :

$6 \times 1 = 6$	$6 \times 7 = 42$
$6 \times 2 = 12$	$6 \times 8 = 48$
$6 \times 3 = 18$	$6 \times 9 = 54$
$6 \times 4 = 24$	$6 \times 10 = 60$
$6 \times 5 = 30$	$6 \times 11 = 66$
$6 \times 6 = 36$	$6 \times 12 = 72$

6. Compare :

6×2 and 2×6	6×5 and 5×6
6×3 and 3×6	6×7 and 7×6
6×4 and 4×6	6×8 and 8×6

7. Multiply each number outside the circle by 3; by 4; by 5; by 6.



Multiply by 6; by 5; by 4; by 3:

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>
8. 243	567	149	759	894
9. 679	295	293	384	839
10. 978	869	687	825	856
11. 207	890	903	708	605

12. Give the products :

$6 \times \$40$	$6 \times 20¢$	6×80 men	6×61 pens
$6 \times \$70$	$6 \times 35¢$	6×32 boys	6×42 pads
$6 \times \$90$	$6 \times 41¢$	6×71 girls	6×81 beads

1. How many times is 6 contained in 12? in 18? in 24? in 48? 60? 54? 36? 66? 42? 72?

2. Give the answers rapidly:

$42 \div 6$	$60 \div 6$	$36 \div 6$	$24 \div 6$	$48 \div 6$
$72 \div 6$	$66 \div 6$	$\frac{1}{6}$ of 48	$\frac{1}{6}$ of 42	$60 \div 6$
$6 \overline{)48}$	$6 \overline{)60}$	$6 \overline{)54}$	$6 \overline{)36}$	$6 \overline{)30}$

Divide each number by 6.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>
3.	480	600	624	540	366
4.	720	618	246	726	612

Complete:

	<i>a</i>	<i>b</i>	<i>c</i>
5.	$15 \div 6 = \text{— with — r.}$	$2 \times 6, + ? = 15$	$? \times 6, + 3 = 15$
6.	$45 \div 6 = \text{— with — r.}$	$? \times 6, + 3 = 45$	$6 \times ?, + 3 = 45$

Divide by 6 and test:

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>
7.	846	864	630	7242	8694
8.	672	294	840	7608	3252

9. Compare in two ways: \$18 and \$6; \$36 and \$6; 42 books and 6 books; 24 hats and 6 hats.

10. There are 96 men marching in 6 equal rows. How many men are there in each row?

11. How many boxes are needed for 108 eggs, if each box holds half a dozen?

Time yourself in these exercises. Then work them again and try to make better speed.

Multiply each number by 2; by 3; by 4; by 5:

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>
1.	468	456	273	332	634	804
2.	684	654	372	233	436	972
3.	236	564	732	548	364	729
4.	632	542	412	485	184	908

Multiply each number by 6; by 5; by 4; by 3:

5.	426	848	408	798	249	284
6.	264	844	840	897	942	428
7.	624	853	480	789	429	842
8.	165	790	981	679	257	912

Divide by 3; by 6:

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
9.	1812	4068	1800	1896
10.	1206	4734	1752	2868
11.	1404	1626	2592	3360
12.	2070	1920	1422	1224
13.	2736	1308	1392	1314

Divide by 5:

14.	1725	1600	2800	2050
15.	2280	1090	2390	1095
16.	2835	2030	1580	3185
17.	3390	1500	1400	4560
18.	3945	1625	2325	5615

1. A rug was reduced from \$ 98 to \$ 69. How much was it reduced?

2. Mother paid \$27 for Jean's coat and \$28 for Helen's. How much did she pay for both?

3. A farmer bought 5 horses at \$225 each. How much did they all cost?

4. There were 52 pupils in the third grade and 39 pupils in the fourth grade. How many more were there in the third grade than in the fourth grade?

5. If 6 coats of the same kind cost \$120, what was the price of each?

6. How many tablecloths at \$5 each could be bought for \$100?

7. Uncle had 720 foreign stamps, which he divided equally among 6 nephews. How many did each get?

8. There were 85 boys at a football game. How many were left when 28 boys went home?

9. Ruth had 96¢. She deposited 48¢ in the school savings bank. How much had she left?

10. There were 26 passengers on one side of the car and 18 passengers on the other side. How many people were in the car?

11. The children printed 60 tickets for a fair. When there were only 28 left how many had been sold?

12. At 5¢ a day, how long did it take Arthur to save enough money to buy a copy of "Robinson Crusoe" costing 80¢?

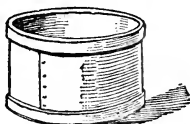
2 pints = 1 quart	2 pt. = 1 qt.
8 quarts = 1 peck	8 qt. = 1 pk.
4 pecks = 1 bushel	4 pk. = 1 bu.



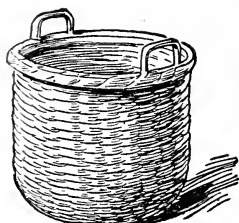
PINT



QUART



PECK



BUSHEL

1. Name some dry articles purchased by the pint; by the quart; by the peck; by the bushel.

2. Secure some sand or grain, and show by actual measurements the number of pints in a quart; quarts in a peck; pecks in a bushel.

3. Memorize the table.

4. 1 bushel = — pecks; 1 peck = — quarts.

5. How many quarts equal 1 bushel?

6. $\frac{1}{4}$ peck = — quarts; $\frac{1}{2}$ peck = — quarts.

7. At 8¢ a pint, find the cost of 1 quart of nuts.

8. A horse eats 12 quarts of oats a day. How many quarts does he eat in 4 days?

9. $2\frac{1}{2}$ pecks = — quarts; 16 quarts = — pecks.

10. James bought $11\frac{1}{2}$ bushels of tomatoes. How many pecks did he buy?

11. Elizabeth bought $\frac{1}{2}$ peck of peas. How many quarts did she get?

1. Name some liquids sold by the pint; by the quart; by the gallon.
2. Memorize this table:

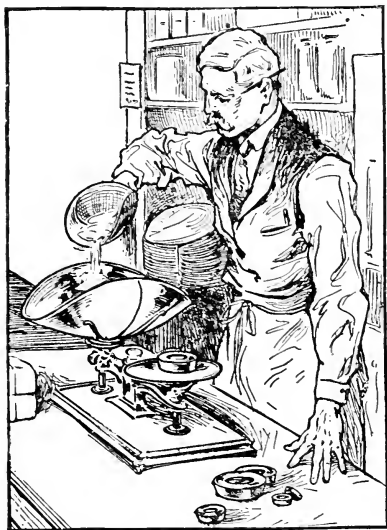
2 pints = 1 quart	2 pt. = 1 qt.
4 quarts = 1 gallon	4 qt. = 1 gal.

3. 2 gallons = how many quarts?
4. From a gallon of milk how many quarts can be sold? how many pints?
5. Mrs. Adams buys 2 quarts of milk a day. How many quarts does she buy in 20 days? how many gallons?
6. At 14¢ a quart, how much does the milk cost her per week?
7. From a jug containing 3 gallons of vinegar, how many quarts can be sold?
8. How many pints are there in 12 quarts? how many gallons?

Copy these problems and insert the answers in the blank spaces:

- | | |
|--------------------|---------------------|
| 9. 1 qt. = — pt. | 14. 4 gal. = — qt. |
| 10. 8 qt. = — gal. | 15. 24 qt. = — gal. |
| 11. 16 pt. = — qt. | 16. 6 pt. = — qt. |
| 12. 8 gal. = — qt. | 17. 4 qt. = — gal. |
| 13. 8 pt. = — qt. | 18. 5 gal. = — qt. |

1. Tell how the following articles are sold: butter, sugar, meat, cheese, tea.



The smallest weight in the picture is called an **ounce weight**. The largest weight is a sixteen-ounce weight, and is called a **pound weight**.

The other weights are half-pound weights, quarter-pound weights, etc.

Any article that the pound weight balances weighs just **one pound**.

Use real scales or make a balance and weigh various articles.

$16 \text{ ounces} = 1 \text{ pound}$ $16 \text{ oz.} = 1 \text{ lb.}$
--

2. Helen's purchase at the store weighs 8 oz. What part of a pound does it weigh?

3. $6 \text{ oz.} + 4 \text{ oz.} + 6 \text{ oz.} = \text{--- oz.} = \text{--- lb.}$

4. $10 \text{ oz.} + 12 \text{ oz.} + 10 \text{ oz.} = \text{--- oz.} = \text{--- lb.}$

5. $\frac{1}{4} \text{ lb.} = \text{--- oz.}$ $\frac{1}{2} \text{ lb.} = \text{--- oz.}$

6. How many 2-ounce packages weigh 1 pound?

1. Ask the grocer or your parents what small articles are sold by the ounce or by the pound.

2. What weights are used by the butcher?

3. Edith bought a 2-ounce package of onion seeds, a 4-ounce package of lettuce seeds, an 8-ounce package of tomato seeds, and a 2-ounce package of flower seeds. How many pounds did she buy in all?

4. Find the cost of 2 lb. of fish at 28¢ a pound.

Copy and fill out:

5. 16 oz. = — lb.

11. $\frac{1}{4}$ lb. = — oz.

6. 1 lb. = — oz.

12. 8×2 oz. = — oz.

7. $\frac{1}{2}$ lb. = — oz.

13. 8×2 oz. = — lb.

8. 8 oz. = — lb.

14. 20 oz. = 1 lb. and — oz.

9. 4 oz. = — lb.

15. 4×4 oz. = — oz.

10. 2 lb. = — oz.

16. 4×4 oz. = — lb.

17. How many ounces are there in $\frac{1}{2}$ pound of sugar?

18. How much must I pay for a chicken weighing 3 lb. at 44¢ a pound?

19. How many ounces of ginger are equal to 6 pounds of ginger?

20. Ruth's mother buys $\frac{1}{4}$ of a pound of knitting wool. How many ounces should she get? How many ounces should she get if she buys $1\frac{1}{2}$ pounds?

21. Find the cost of $\frac{1}{4}$ lb. of butter at 36¢ a pound.

1. Measure the width of a table in feet and inches.
2. $\frac{1}{4}$ foot = — inches ; $\frac{1}{3}$ foot = — inches.
3. Some articles are sold by a measure 3 times the length of a foot rule. Name some of them.
4. Draw a line on the blackboard 3 feet in length.
5. The line you have drawn is one yard long.

$3 \text{ feet} = 1 \text{ yard}$ $3 \text{ ft.} = 1 \text{ yd.}$

6. A piece of cloth is 6 yards long. How many feet is it in length?

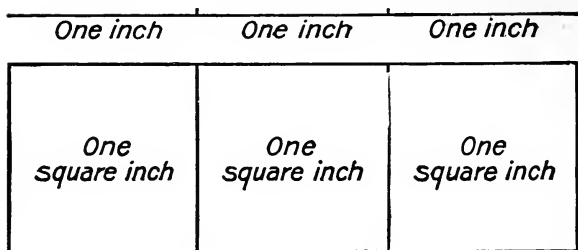
Copy and fill in the blanks:

- | | |
|--------------------|-------------------------------|
| 7. 3 ft. = — in. | 13. 4 ft. = — in. |
| 8. 3 ft. = — yd. | 14. $\frac{1}{2}$ ft. = — in. |
| 9. 2 ft. = — in. | 15. $\frac{1}{3}$ yd. = — ft. |
| 10. 12 in. = — ft. | 16. 15 ft. = — yd. |
| 11. 18 ft. = — yd. | 17. 7 yd. = — ft. |
| 12. 5 ft. = — in. | 18. 6 ft. = — in. |

Change:

- | | |
|----------------------------------|----------------------|
| 19. $\frac{1}{4}$ ft. to inches. | 25. 21 ft. to yards. |
| 20. $\frac{1}{3}$ ft. to inches. | 26. 12 ft. to yards. |
| 21. 4 yd. to feet. | 27. 24 yd. to feet. |
| 22. 8 yd. to feet. | 28. 48 yd. to feet. |
| 23. 27 ft. to yards. | 29. 36 yd. to feet. |
| 24. 24 ft. to yards. | 30. 5 yd. to feet. |

1. Frank has a row of potatoes in his garden 150 ft. long. How many yards long is it?
2. Susan lives 360 yd. from the schoolhouse. How many feet does she live from the schoolhouse?
3. A steamship that is 960 ft. in length is how many yards long?
4. A man who is 6 ft. in height is how many inches in height? how many yards?
5. The schoolroom is 40 ft. in length. How many yards and feet over is that?
6. The schoolroom is 30 ft. in width. How many yards wide is it?
7. John is 5 ft. 4 in. in height. How many inches is he in height? Show this by the tapeline.
8. Mary sits 5 ft. from the teacher's desk. How many inches does she sit from the teacher's desk?
9. The schoolroom door is 3 ft. 9 in. wide. How many inches wide is the door?
10. Paul measures the distance that he lives from the schoolhouse and finds that it is 900 feet. How many yards is this distance?
11. Two girls measure with a tapeline the distance around the schoolhouse, and find that it is 140 ft. How many yards and how many feet over is this distance?
12. Mary is 4 ft. 7 in. tall. How many inches in height is she?



1. Measure this figure with your rule. How long is it? how wide? How many *equal sides* has it?

2. What is a square inch? How does the entire figure differ from one square inch?

A figure having square corners and longer than it is wide is called an **oblong**.

3. Cut from paper an oblong 1 inch wide and 4 inches long, and fold it to show the number of square inches in it. Do the same with an oblong 2 inches wide and 4 inches long.

4. An oblong is 5 inches long and contains 15 square inches. Draw the oblong to show the width and the number of square inches.

5. An oblong has 24 square inches. It is 6 inches long. Draw the figure on paper. Fold it to show each square inch.

6. An oblong 6 inches long and 3 inches wide will make an oblong — inches long and 1 inch wide.

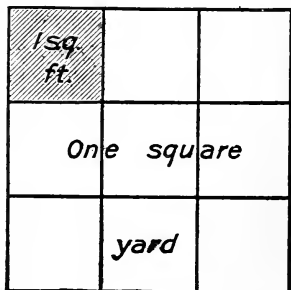
7. Show that a square containing 9 square inches is 3 inches on each side.

1. Draw a square 1 inch long and 1 inch wide. Call it a **square inch**.

2. Draw on the blackboard a square 1 foot long and 1 foot wide. Call it a **square foot**.

3. Draw on the blackboard a square 1 yard long and 1 yard wide. Call it a **square yard**.

4. Separate, by points, each side of the square yard into 3 equal parts. Connect these points by straight lines. What is the size of each square? How many square feet are there in a square yard?



5. This picture shows a square yard, smaller than it really is. How many square feet does it show?

$9 \text{ square feet} = 1 \text{ square yard}$ $9 \text{ sq. ft.} = 1 \text{ sq. yd.}$

6. Measure your desk. Decide on a convenient scale and draw a figure to represent the top of your desk.

7. Let $\frac{1}{4}$ inch stand for 1 foot, and draw an oblong to represent the floor of a room 20 feet long and 16 feet wide.

8. Decide on a convenient scale and draw an oblong to represent a flower bed 10 feet long and 5 feet wide.

1. Draw an oblong 6 inches long and 4 inches wide. Divide it into square inches. How many square inches are there in one row? How many rows are there? How many square inches are there in the entire oblong?

$$4 \times 6 \times 1 \text{ sq. in.} = 24 \text{ sq. in.}$$

2. Draw another oblong 3 inches long and 2 inches wide, and find, in the same way, how many square inches it contains.

3. Draw an oblong 5 inches long and 4 inches wide and find, in the same way, how many square inches it contains.

Notice that the number of square inches equals the product of the number of inches in the length by the number of inches in the width.

4. Find the number of square feet in the floor of your classroom.

5. How many square inches are there in a four-inch square? Illustrate.

6. How many square inches can you cut from a piece of paper 4 inches long and 4 inches wide?

7. Draw two cards each containing 12 square inches.

8. A garden bed is 6 feet long and 10 feet wide. How many square feet does it contain?

9. How many square inches are there in a scarf 50 in. long and 6 in. wide?

1. How many pounds of sugar are there in 6 bags of 25 lb. each?
2. There are 248 pages in a book. When 89 pages are read, how many pages remain unread?
3. A barrel of flour weighs 196 pounds. How much is left after 68 pounds have been used?
4. There are 32 quarts in a bushel. How many quarts equal 5 bushels?
5. There are 9 school months in a year. How many school months are there in 6 years?
6. How many dollars are there in a purse containing 3 dollars, 2 quarters, 3 dimes, and 4 nickels?
7. A horse goes 36 miles in 6 hours; a bicycle goes the same distance in 4 hours. Find the speed per hour of each.
8. There are 181 pupils on the second floor of a school building and 157 pupils on the third floor. How many pupils are there on both floors? How many more are on the second floor than on the third floor?
9. A bushel of shelled corn weighs 56 pounds. How many pounds are there in 6 bushels?
10. There are 144 pens in a gross. How many are there in 5 gross?
11. There are 24 sheets of paper in a quire. How many sheets are there in 6 quires?
12. How much do 6 pounds of prunes cost at 9 cents a pound?

1. Read the numbers on the face of the clock. Tell the time.

2. Observe the small spaces on the outer edge of the face. These are called **minute spaces**.

3. Over how many of these spaces does the minute hand move in passing around the face from XII to XII again?

4. How long is the minute hand in passing from XII to I? the hour hand?

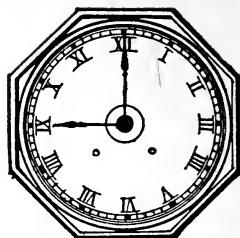
5. Helen began studying at 15 minutes past 4 o'clock. She stopped at 20 minutes past 5. How long did she study?

6. Arthur played tennis from 2 o'clock on Saturday until half past 5. How long did he play?

7. How many minutes are there in 1 hr.? in 2 hr.? in 4 hr.? in $\frac{1}{2}$ hr.?

8. When the hour hand is at XII, what is the time if the minute hand points to V? to III? to I?

9. Count the hours on the clock face from 9 o'clock, the opening of school, until 9 o'clock the next morning. How many are there? These 24 hours include both day time and night time.



60 minutes = 1 hour 60 min. = 1 hr.

24 hours = 1 day 24 hr. = 1 da.

The day always begins at 12 o'clock, **midnight**. The time from midnight to noon is called **forenoon**. The time from 12, noon, to midnight is called **afternoon**.

We write **A.M.** for *forenoon* and **P.M.** for *afternoon*.
8.20 A.M. is read 20 minutes past eight in the morning.

1. Read 6.10 A.M.; 4.25 A.M.; 6.30 P.M.; 10.00 P.M.
2. How many hours is it from 9 A.M. to 5 P.M.? from 10 P.M. to 6 A.M.?

7 days = 1 week	7 da. = 1 wk.
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JULY						
SUN	MON	TUE	WED	THU	FRI	SAT
..	..	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31

3. Make a calendar for August similar to the one for July, beginning with Friday, Aug. 1.

4. Name the months of the year, beginning with January.

12 months = 1 year	12 mo. = 1 yr.
52 weeks = 1 year	52 wk. = 1 yr.

5. How many months are there in 5 years?
6. How many weeks are there in 3 years? in 6 years?
7. How many days are there in 6 weeks?
8. How many hours are there in 6 days?
9. How many minutes are there in 4 hours?
10. Give the dates of four important holidays.

1. Show by adding seven 2's that $7 \times 2 = 14$; show by adding seven 3's that $7 \times 3 = 21$; and so on.

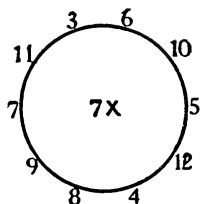
2. Count by 7's to 21; to 42; to 63; to 84.

3. Build the table of 7's.

4. 2×7 days = ? 12×7 books = ?

5. Compare in value 5×7 and 7×5 ; 3×7 and 7×3 ; 7×6 and 6×7 ; 7×2 and 2×7 ; 4×7 and 7×4 .

6. Memorize this table:



$7 \times 1 = 7$	$7 \times 7 = 49$
$7 \times 2 = 14$	$7 \times 8 = 56$
$7 \times 3 = 21$	$7 \times 9 = 63$
$7 \times 4 = 28$	$7 \times 10 = 70$
$7 \times 5 = 35$	$7 \times 11 = 77$
$7 \times 6 = 42$	$7 \times 12 = 84$

7. What multiplicand and multiplier make:

49	12	36	28	24
35	30	14	18	14
63	42	84	77	21

Multiply:

a	b	c	d	e
8. 456	265	157	963	904
<u>7</u>	<u>7</u>	<u>7</u>	<u>7</u>	<u>7</u>
9. 7739	8497	6198	5424	6339
<u>7</u>	<u>7</u>	<u>7</u>	<u>7</u>	<u>7</u>

Multiply by 7, testing answers:

10. 4693	7528	6934	8576	7935
11. 7208	5697	2469	3875	8094

1. How many times is 7 contained in 14? in 21? 42? 63? 28? 35? 49? 70? 77? 56?

2. Find $\frac{1}{7}$ of 84; 63; 42; 35; 56; 70; 14; 21.

Find the quotients and the remainders:

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>
3. $7 \overline{)42}$	$7 \overline{)63}$	$7 \overline{)56}$	$7 \overline{)49}$	$7 \overline{)84}$	$7 \overline{)35}$
4. $7 \overline{)72}$	$7 \overline{)52}$	$7 \overline{)48}$	$7 \overline{)33}$	$7 \overline{)46}$	$7 \overline{)80}$

Divide by 7:

5. 84	56	59	68	45	36
6. 217	364	427	637	273	696

Divide and test:

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>
7. $7 \overline{)2436}$	$6 \overline{)7392}$	$7 \overline{)8694}$	$6 \overline{)7854}$	$7 \overline{)4697}$
8. $5 \overline{)2605}$	$7 \overline{)8050}$	$6 \overline{)3078}$	$7 \overline{)2093}$	$5 \overline{)8090}$
9. $7 \overline{)7385}$	$6 \overline{)2862}$	$7 \overline{)2534}$	$5 \overline{)3205}$	$7 \overline{)6972}$

10. How many 7-pound bags can be filled from 259 pounds of sugar?

11. How many weeks are there in 49 days?

12. How many suits, each requiring 7 yards, can be made from a piece of cloth containing 84 yards?

13. How many 7¢ packages of crackers can be bought for 84¢?

1. Show by adding eight 2's that $8 \times 2 = 16$; show by adding eight 3's that $8 \times 3 = 24$, and so on.

2. Count by 8's to 24; to 64; to 96.

3. Build the table of 8's.

4. How many are 2×8 balls? 3×8 books? 4×8 boys? 5×8 pens? 6×8 apples?

5. Give quickly:

6×8

8×6

7×8

5×8

8×4

8×10

8×2

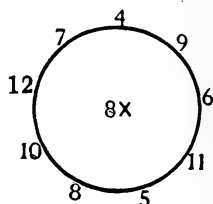
8×11

8×12

4×8

8×8

8×5



6. Memorize this table:

$8 \times 1 = 8$

$8 \times 7 = 56$

$8 \times 2 = 16$

$8 \times 8 = 64$

$8 \times 3 = 24$

$8 \times 9 = 72$

$8 \times 4 = 32$

$8 \times 10 = 80$

$8 \times 5 = 40$

$8 \times 11 = 88$

$8 \times 6 = 48$

$8 \times 12 = 96$

7. Give answers:

$? \times 8 = 32$

$7 \times ? = 56$

$6 \times ? = 48$

$? \times 5 = 40$

$? \times 8 = 72$

$8 \times ? = 64$

$10 \times ? = 80$

$? \times 3 = 27$

$12 \times ? = 84$

$2 \times ? = 18$

Multiply by 8:

$a \quad 8. \quad 6230$

$b \quad 5178$

$c \quad 8629$

$d \quad 9310$

$e \quad 7865$

$9. \quad 2937$

8694

9083

8697

7289

$10. \quad 9048$

6937

2865

4705

8136

Give the products rapidly:

$11. \quad 8 \times 50$

8×70

8×91

8×12

8×31

$12. \quad 7 \times 40$

7×60

7×71

8×11

7×20

$13. \quad 8 \times 90$

7×81

8×30

7×21

8×61

1. $8 \times 2 = ?$ $16 \div 8 = ?$ $8 \times 3 = ?$ $24 \div 8 = ?$
 2. $8 \times 4 = ?$ $32 \div 8 = ?$ $8 \times 5 = ?$ $40 \div 8 = ?$
 3. $48 \div 8 = ?$ $56 \div 8 = ?$ $64 \div 8 = ?$ $72 \div 8 = ?$ $96 \div 8 = ?$
 4. 64 contains 8 ——— times. 72 contains 8 ——— times.
 5. 58 contains 8 ——— times, with ——— remainder.
 6. 83 contains 8 ——— times, with ——— remainder.

Give the quotients and the remainders :

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>
7. $8 \overline{)64}$	$8 \overline{)32}$	$8 \overline{)40}$	$8 \overline{)72}$	$8 \overline{)56}$
8. $8 \overline{)16}$	$7 \overline{)56}$	$8 \overline{)24}$	$6 \overline{)48}$	$8 \overline{)48}$
9. $4 \overline{)35}$	$8 \overline{)89}$	$5 \overline{)44}$	$8 \overline{)98}$	$8 \overline{)93}$

Find :

10. $\frac{1}{8}$ of 24 $\frac{1}{8}$ of 96 $\frac{1}{8}$ of 88 $\frac{1}{8}$ of 80 $\frac{1}{8}$ of 48
 11. $\frac{1}{8}$ of 640 $\frac{1}{8}$ of 720 $\frac{1}{8}$ of 400 $\frac{1}{8}$ of 320 $\frac{1}{8}$ of 800

Divide by 8 :

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>
12. 176	824	624	472	608
13. 8072	2096	3072	4088	6024
14. 2904	8104	2992	7904	8600

15. How many tablets, at 8¢ each, can be bought for 72¢?

16. John collected 240¢ in equal amounts from 8 children for a charitable fund. How much did each give?

1. Show by adding nine 2's that $9 \times 2 = 18$; show by adding nine 3's that $9 \times 3 = 27$, and so on.

2. Count by 9's to 27; to 54; to 108.

3. Build the table of 9's.

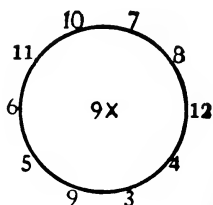
4. Compare 6×9 and 9×6 ; 8×9 and 9×8 .

5. Multiply by 9:

40 60 80 20 50 10 30 70 90 31 51 71

6. Memorize this table:

$9 \times 1 = 9$	$9 \times 7 = 63$
$9 \times 2 = 18$	$9 \times 8 = 72$
$9 \times 3 = 27$	$9 \times 9 = 81$
$9 \times 4 = 36$	$9 \times 10 = 90$
$9 \times 5 = 45$	$9 \times 11 = 99$
$9 \times 6 = 54$	$9 \times 12 = 108$



Give two numbers that form each of these products.

7. 21, 36, 44, 48, 50, 40, 54, 45, 33, 27

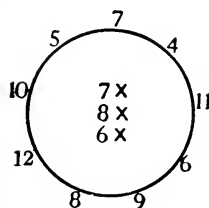
8. 88, 90, 60, 77, 81, 63, 66, 72, 56, 80

Multiply by 9:

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>
9.	4693	7286	4615	8738	6967
10.	4135	2874	6398	1869	7043
11.	8286	3697	4589	2893	9097
12.	9387	2945	9304	6356	2864
13.	6005	7894	9999	6090	7500

Multiply by 9 :

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>
1.	4226	8393	3786	2468	8321
2.	5483	6692	2294	8329	6245
3.	6396	2594	4968	5692	9374
4.	7278	7246	5328	7386	8928
5.	6304	5008	7090	8540	6384



Find the products :

6. 9×38 gal. 9×24 da. 9×16 min.

7. 9×17 bu. 9×29 mo. 9×25 ¢

8. Find products first by 7, then by 8, then by 6, of each number outside

the circle.

9. State the products rapidly. Memorize any combinations that trouble you.

4 4	9 4	9 5	7 9	11 8	6 8	9 7	10 5	11 5
8 5	7 7	8 4	7 4	6 9	7 6	8 7	10 8	11 7
12 6	7 8	11 6	10 7	6 5	7 5	6 6	8 9	8 8
9 9	12 5	8 6	10 6	9 8	12 4	12 9	12 3	12 7

1. How many tables, at \$9 each, can be bought for \$18? for \$27? for \$36? for \$45? for \$54? for \$63?

2. Give the quotients and the remainders:

$63 \div 9$	$81 \div 9$	$45 \div 5$	$36 \div 4$	$18 \div 9$
$75 \div 9$	$64 \div 9$	$83 \div 9$	$95 \div 9$	$97 \div 9$
$\frac{1}{9}$ of 36	$\frac{1}{9}$ of 99	$\frac{1}{9}$ of 54	$\frac{1}{9}$ of 90	$\frac{1}{9}$ of 72
$\frac{1}{9}$ of 27	$\frac{1}{9}$ of 45	$\frac{1}{9}$ of 81	$\frac{1}{9}$ of 63	$\frac{1}{9}$ of 108

3. Tell which is greater and how much:

$\frac{1}{9}$ of 81 or $\frac{1}{3}$ of 30	$\frac{1}{8}$ of 40 or $\frac{1}{9}$ of 45
$\frac{1}{8}$ of 64 or $\frac{1}{9}$ of 63	$\frac{1}{7}$ of 63 or $\frac{1}{9}$ of 81

Divide by 9:

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>
4. 2637	1856	2934	7686	8172
5. 6381	2097	3087	6075	7236
6. 8469	3762	2988	2205	3609
7. 7587	6291	8694	2486	6093

8. Give the quotients rapidly:

$180 \div 9$	$360 \div 9$	$900 \div 9$	$720 \div 9$	$729 \div 9$
$279 \div 9$	$549 \div 9$	$459 \div 9$	$639 \div 9$	$450 \div 9$

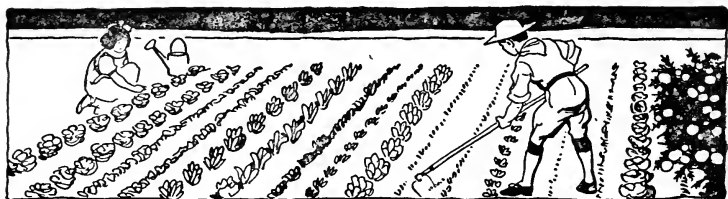
9. If a postman delivers 954 letters in 9 hours, how many letters does he average in one hour?

10. How many times can 9 inches be marked off from a line 3 feet in length?

11. At 3 melons for 15 cents, how many melons can be bought for 45 cents?

1. There are 8 pints in one gallon. How many pints are there in 32 gallons?
2. A train runs 26 miles in 1 hour. How far can it run in 9 hours?
3. How much will 8 yards of lawn cost at 32 cents a yard?
4. There are 9 boys in a baseball team. How many teams can be formed with 36 boys?
5. At 9 cents a pound, how many pounds of sugar can be bought for 153 cents?
6. There are 168 cabbage plants in 8 rows. How many are there in each row?
7. How many bushels equal 396 pecks?
8. How many gallons equal 396 quarts?
9. How many weeks equal 287 days?
10. If 8 hours is a day's work, for how many days should a man be paid who has worked 304 hours?
11. 6 melons cost 78 cents. How much is that apiece?
12. How many yards equal 54 feet?
13. At 96 cents a gallon, what is the cost of a pint of molasses?
14. Seven o'clock A.M. is how many hours after midnight?
15. 144 square inches equal one square foot. How many square inches equal 8 square feet?

Robert's School Garden



1. Robert had a plot in a school garden 10 feet long and 8 feet wide. How many square feet were there in his plot?

2. He planted a row of tomatoes from which he raised 96 pounds. How much did he get for them at 9¢ a pound?

3. He planted two rows of beans which he thinned out to 3 plants to the foot. How many plants did he then have on the 20 feet?

4. How much did he get for 15 pounds of beans at 8¢ a pound?

5. He planted 35 turnips 7 to the foot. How many feet of turnips did he plant?

6. He raised 28 pounds of turnips which he sold at 3¢ a pound. How much did he get for them?

7. He also planted beets, carrots, and Swiss chard. He received 30¢ for his beets, 20¢ for his carrots, and 25¢ for his chard. How much did he get for these vegetables?

8. He raised and sold 10 heads of lettuce at 5¢ apiece and 8 bunches of radishes at 5¢ a bunch. How much did he get for them?

Answer quickly :

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>
1.	6×3	5×4	$10 - 2$	4×5	$\frac{1}{3}$ of 24
2.	7×10	6×6	$18 - 6$	4×3	$64 \div 8$
3.	9×2	8×10	$40 - 10$	4×4	$\frac{1}{6}$ of 48
4.	7×3	6×5	$\frac{1}{7}$ of 42	9×3	7×8
5.	4×7	10×9	$90 \div 9$	5×5	7×4
6.	$20 - 4$	$\frac{1}{4}$ of 28	8×3	$16 - 10$	$49 \div 7$
7.	$22 - 7$	$\frac{1}{5}$ of 20	7×6	$\frac{1}{2}$ of 24	$\frac{1}{3}$ of 36
8.	6×4	$31 - 6$	$\frac{1}{3}$ of 27	8×7	5×8
9.	4×9	3×10	$54 - 6$	9×6	$28 \div 4$
10.	5×2	$\frac{1}{5}$ of 25	9×9	$32 \div 8$	$\frac{1}{6}$ of 30
11.	8×6	$48 \div 8$	7×9	$\frac{1}{5}$ of 35	6×10
12.	8×5	4×8	$\frac{1}{3}$ of 18	$32 \div 4$	3×5
13.	3×6	$56 \div 8$	$\frac{1}{6}$ of 72	8×8	9×7
14.	$54 - 6$	$72 \div 8$	$\frac{1}{4}$ of 48	5×9	8×9
15.	$39 - 7$	9×8	$47 - 8$	$\frac{1}{4}$ of 44	$\frac{1}{6}$ of 66
16.	$\frac{1}{9}$ of 63	$72 - 9$	$81 \div 9$	$\frac{1}{5}$ of 40	$\frac{1}{6}$ of 42
17.	$\frac{1}{3}$ of 30	$83 - 9$	7×7	$\frac{1}{2}$ of 18	$\frac{1}{4}$ of 36
18.	9×12	9×9	8×7	$35 \div 5$	$56 \div 7$
19.	6×7	9×5	$\frac{1}{5}$ of 30	6×11	8×11
20.	9×10	7×12	$84 \div 7$	7×11	$44 \div 11$

Find how long it takes you to get the *right answers* to each set of five examples.

I

- $9 \times 8 = ?$ $7 \times 6 = ?$
- 64 qt. = ——— pk.
3 bu. = ——— pk.
- $7854 \div 7 = ?$
 $9864 \div 9 = ?$
- Make a diagram on a scale of $\frac{1}{12}$ to show a rug 3 ft. by 5 ft.
- $6 + 7 + 9 + 0 + 4 = ?$

II

- $1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 = ?$
- $84 - 7 = ?$ $79 - 8 = ?$
 $57 - 9 = ?$ $91 - 7 = ?$
- Give the sums:

9	7	5	15	13	7	5
8	6	8	7	4	9	9
<u>7</u>	<u>6</u>	<u>8</u>	<u>7</u>	<u>4</u>	<u>9</u>	<u>9</u>
- $56371 \div 7 = ?$
- $7209 \div 9 = ?$

III

- Add \$99, \$40, \$62.
- 8 pk. = ——— qt.
- Add:

9	7	5	8	5
3	8	6	9	4
4	9	7	8	7
5	7	1	7	9
6	6	9	6	3
<u>7</u>	<u>5</u>	<u>7</u>	<u>5</u>	<u>4</u>
- 2 hr. = ——— min.
- 3 da. = ——— hr.

IV

- How many pints of milk are used in 30 days if 1 qt. and 1 pt. are used each day?
- How many ounce packages can be made from 9 lb. of cabbage seed?
- $5982 \div 6 = ?$
- $302 - 189 = ?$
- $9 \times 309 = ?$ $7 \times 694 = ?$



CHAPTER V

READING AND WRITING NUMBERS

1. The ten-thousands are written 10,000; 20,000; 30,000; 40,000; 50,000; 60,000; 70,000; 80,000; 90,000.

For convenience in reading numbers of more than four figures, the figures are often separated by commas into groups of three figures each, beginning at the right. These groups are called **periods**.

The first period, counting from the right, is **units**, the second, **thousands**.

The following table shows the arrangement of these periods, and the three orders of figures in each period:

THOUSANDS' PERIOD			UNITS' PERIOD		
Hundred-thousands	Ten-thousands	Thousands	Hundreds	Tens	Ones
6	4	1,	3	7	6

The number in the table is read *641 thousand 376*.

2. Read : During the holidays the post office received for mailing 30,956 parcels, 229,875 postal cards, and 116,083 letters.

1. Read: In one year the canning clubs in several states canned 277,826 quarts of fruit, 22,180 quarts of corn, 50,158 quarts of beans, 170,606 quarts of tomatoes, 35,185 quarts of other vegetables, and 6249 quarts of meat.

2. Read: During 1918 our army consumed \$573,123 worth of chocolate and \$356,970 worth of molasses.

Copy, point off, and read:

3. 19000	40084	625476	900053
4. 20135	56506	308390	702401
5. 81125	70009	520067	601500
6. 73241	80808	786500	350000

Express in figures:

7. Forty-two thousand.
8. Sixty-six thousand four.
9. Seventy-five thousand fifty.
10. Thirty-nine thousand one hundred twenty-two.
11. Two hundred ten thousand three hundred fifty.
12. Five hundred sixty-five thousand one hundred.
13. One hundred twenty-five thousand.
14. Six hundred thousand thirty-five.
15. Nine thousand twenty-six.
16. Five hundred ninety thousand eighty.
17. Nine hundred ninety-nine thousand nine hundred ninety-nine.

Measuring Heat

We measure heat by a thermometer. The lines on a thermometer mark the degrees of heat.

1. Notice that there are 5 spaces on this thermometer for every 10 degrees. How many degrees are represented by each space?

2. What temperature is shown on this thermometer?

3. The freezing point of water is 32° degrees (written 32°) and the boiling point 212° . How many degrees are there between these two points?

4. If the water in a kettle is at 78° , how many degrees must the temperature rise before the water will boil?

5. The proper temperature of a room is 68° . How much more heat is needed if the thermometer in a room shows 59° ?

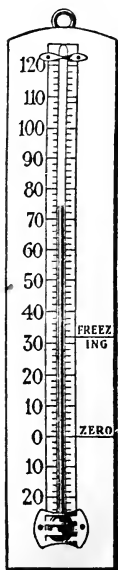
6. How many degrees too warm is a room if the thermometer shows 72° ?

7. When Ruth was ill her temperature rose from 98° to 103° . How many degrees did it rise?

8. How many degrees does the temperature fall during a day when it is 82° in the morning and 30° at night?

9. How many degrees does the temperature rise from 63° in the morning to 80° in the afternoon?

10. How far above the freezing point is 70° ?



1. Add 234, 359, and 266.

Think:

234 *Ones.* 6, 15, 19. Write **9**. Carry 1 to tens'
359 column.

266 *Tens.* 1, 7, 12, 15. Write **5**. Carry 1 to
859 hundreds' column.

Hundreds. 1, 3, 6, 8. Write **8**.

Test by adding downwards.

Write from dictation; then add and test:

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>
2.	234	230	101	231	301	243
	326	325	304	405	226	206
	<u>434</u>	<u>265</u>	<u>376</u>	<u>568</u>	<u>304</u>	<u>306</u>
3.	405	304	604	400	291	905
	304	349	787	697	743	634
	<u>296</u>	<u>200</u>	<u>342</u>	<u>345</u>	<u>456</u>	<u>393</u>
4.	623	344	23	509	20	502
	5	593	906	5	102	205
	<u>340</u>	<u>25</u>	<u>25</u>	<u>820</u>	<u>67</u>	<u>50</u>
5.	708	931	68	7	423	791
	55	67	834	751	92	8
	<u>634</u>	<u>8</u>	<u>436</u>	<u>543</u>	<u>899</u>	<u>958</u>
6.	589	389	543	135	246	798
	673	472	619	697	908	789
	<u>458</u>	<u>564</u>	<u>789</u>	<u>804</u>	<u>753</u>	<u>698</u>

1. Find the sum of 2430, 4307, and 68.

Think :

2430
4307
68
6805

Ones. 8, 15. Write **5**. Carry 1 to tens' column.

Tens. 7, 10. Write **0**. Carry 1 to hundreds' column.

Hundreds. 1, 4, 8. Write **8**.

Thousands. 4, 6. Write **6**.

Write from dictation ; then add and test :

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>
2.	23	378	298	1008	603
	604	49	342	49	2798
	<u>3068</u>	<u>3067</u>	<u>6781</u>	<u>706</u>	<u>6987</u>
3.	1304	2004	4987	3740	6425
	279	3050	9	609	4020
	6000	50	807	4203	205
	<u>200</u>	<u>674</u>	<u>5002</u>	<u>6001</u>	<u>1347</u>

4. Add the examples on page 54.

Addition by Endings

Give sums from left to right:

5.	16 + 9	26 + 9	46 + 9	66 + 9	76 + 9
6.	17 + 5	37 + 5	47 + 5	67 + 5	87 + 5
7.	8 + 6	18 + 6	28 + 6	38 + 6	68 + 6
8.	19 + 5	39 + 5	99 + 5	79 + 5	69 + 5

Add and test :

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>
1.	3	4	2	2	5	6
	5	2	1	3	7	5
	4	7	5	4	9	9
	6	3	4	5	3	8
	2	4	1	6	1	7
	6	4	8	7	6	4
	5	5	2	8	8	3
	<u>4</u>	<u>3</u>	<u>5</u>	<u>9</u>	<u>4</u>	<u>2</u>
2.	6	8	28	50	25	123
	3	2	34	37	48	481
	5	4	56	23	7	73
	4	6	67	52	36	29
	7	5	41	18	29	167
	3	3	29	26	54	423
	8	7	73	32	83	65
	<u>9</u>	<u>4</u>	<u>26</u>	<u>54</u>	<u>30</u>	<u>122</u>
3.	65	42	76	81	34	49
	56	54	37	19	46	74
	34	12	69	56	94	329
	43	53	74	68	67	98
	14	55	33	74	52	72
	64	45	23	48	29	445
	50	34	14	33	43	94
	<u>30</u>	<u>40</u>	<u>50</u>	<u>60</u>	<u>70</u>	<u>80</u>

Add rapidly and test, finding 3 answers in 1 minute.

Write the answers on a piece of paper placed beneath the examples.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>
1.	2345	3256	3556	4325	2546
	3253	5433	5234	2534	3452
	1432	2345	3245	3523	2543
	2564	4356	5243	2456	3245
	<u>7316</u>	<u>5134</u>	<u>2356</u>	<u>5346</u>	<u>1236</u>
2.	2434	3245	2546	6513	5342
	3256	1452	4532	3245	4254
	5145	5416	3251	5314	6143
	4253	2533	5424	2425	3325
	<u>3242</u>	<u>3254</u>	<u>1243</u>	<u>5253</u>	<u>2543</u>
3.	6325	6436	6323	6546	6546
	4264	2462	2566	3562	4362
	2633	6354	6344	6255	6543
	1462	5633	2565	5364	2544
	<u>6326</u>	<u>3265</u>	<u>6355</u>	<u>4534</u>	<u>6355</u>

4. Give sums rapidly, thus: $34 + 30 + 6 = 70$.

34 + 36	56 + 56	28 + 38	48 + 64	25 + 56
56 + 45	67 + 48	47 + 39	37 + 25	66 + 39
38 + 17	37 + 26	59 + 17	35 + 45	25 + 28
29 + 16	25 + 47	57 + 26	65 + 29	38 + 26
19 + 28	48 + 25	39 + 59	47 + 47	29 + 25

1. From 803 subtract 576.

$$\begin{array}{r}
 7913 \\
 803 = 7 \text{ hundreds} + 9 \text{ tens} + 13 \text{ ones} \\
 576 = 5 \text{ hundreds} + 7 \text{ tens} + 6 \text{ ones} \\
 \hline
 227 = 2 \text{ hundreds} + 2 \text{ tens} + 7 \text{ ones}
 \end{array}$$

FIRST METHOD*

Think:

Ones. $6 + 7 = 13$. Write 7.

Tens. $7 + 2 = 9$. Write 2.

Hundreds. $5 + 2 = 7$. Write 2.


SECOND METHOD*

Think:

Ones. $13 - 6 = 7$. Write 7.

Tens. $9 - 7 = 2$. Write 2.


Hundreds. $7 - 5 = 2$. Write 2.

Subtract and test: 

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>
2.	604 <u>160</u>	809 <u>341</u>	701 <u>202</u>	902 <u>720</u>	606 <u>408</u>	705 <u>496</u>
3.	2042 <u>1012</u>	4106 <u>2014</u>	5001 <u>3014</u>	8012 <u>5707</u>	4400 <u>3870</u>	1407 <u>1289</u>

Read; then subtract and test:

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>
4.	8404 <u>3625</u>	7604 <u>4896</u>	5041 <u>1979</u>	5202 <u>1824</u>	7011 <u>4583</u>
5.	7024 <u>3767</u>	8401 <u>4574</u>	5401 <u>2519</u>	8704 <u>6247</u>	4087 <u>1069</u>

* See note, page 88. 

1. From 700 take 264.

6 9 10

700 = 6 hundreds + 9 tens + 10 ones

264 = 2 hundreds + 6 tens + 4 ones

436 = 4 hundreds + 3 tens + 6 ones

Subtract and test:

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>
2.	500 <u>154</u>	600 <u>247</u>	900 <u>618</u>	400 <u>197</u>	800 <u>372</u>	700 <u>309</u>
3.	300 <u>263</u>	700 <u>288</u>	600 <u>327</u>	800 <u>561</u>	200 <u>181</u>	400 <u>397</u>
4.	300 <u>194</u>	800 <u>245</u>	800 <u>769</u>	100 <u>91</u>	600 <u>448</u>	500 <u>238</u>

5. Make, solve, and test 20 examples like the above
Subtract and test:

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>
6.	769 <u>374</u>	819 <u>568</u>	346 <u>94</u>	665 <u>374</u>	749 <u>298</u>	864 <u>539</u>
7.	332 <u>140</u>	748 <u>339</u>	552 <u>429</u>	175 <u>68</u>	729 <u>549</u>	534 <u>360</u>

Subtraction by Endings

Subtract rapidly:

8. 18 - 9 28 - 9 38 - 9 48 - 9 68 - 9 98 - 9
9. 17 - 9 27 - 9 37 - 9 47 - 9 77 - 9 87 - 9

Subtract and test. Try to find the *right answers* to five examples in 1 minute.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>
1.	6432 <u>4176</u>	7244 <u>5371</u>	6475 <u>3879</u>	7994 <u>3877</u>	8641 <u>1282</u>
2.	4531 <u>1522</u>	4351 <u>1543</u>	4234 <u>1235</u>	2432 <u>1344</u>	2134 <u>1545</u>
3.	5423 <u>2545</u>	4215 <u>1567</u>	3254 <u>1565</u>	3524 <u>1566</u>	8231 <u>4743</u>
4.	4253 <u>1464</u>	3231 <u>1865</u>	5453 <u>1974</u>	8121 <u>3642</u>	6414 <u>3892</u>
5.	6304 <u>3168</u>	7065 <u>1474</u>	6401 <u>3162</u>	8014 <u>6202</u>	4706 <u>2165</u>
6.	4060 <u>2976</u>	8305 <u>6012</u>	8560 <u>3574</u>	6070 <u>4304</u>	4904 <u>1060</u>
7.	6105 <u>2166</u>	7805 <u>4991</u>	6099 <u>4814</u>	3940 <u>2108</u>	6303 <u>1494</u>
8.	8110 <u>4884</u>	4444 <u>2666</u>	6222 <u>4879</u>	8314 <u>6070</u>	8196 <u>7246</u>

9-28. Write the four numbers under 1 *a* and 2 *a*, (6432, 4176, 4531, 1522) and add them. Do the same with 1 and 2 in each of the other columns; then with 3 and 4; then with 5 and 6; and then with 7 and 8.

1. From 5000 take 3456.

4 9 9 10

5 0 0 0 = 4 thousands + 9 hundreds + 9 tens + 10 ones

3 4 5 6 = 3 thousands + 4 hundreds + 5 tens + 6 ones

1 5 4 4 = 1 thousand + 5 hundreds + 4 tens + 4 ones

Subtract:

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>
2.	$\begin{array}{r} 6734 \\ 4578 \\ \hline \end{array}$	$\begin{array}{r} 8090 \\ 5694 \\ \hline \end{array}$	$\begin{array}{r} 7004 \\ 5896 \\ \hline \end{array}$	$\begin{array}{r} 6000 \\ 4187 \\ \hline \end{array}$	$\begin{array}{r} 9000 \\ 3999 \\ \hline \end{array}$
3.	$\begin{array}{r} 9084 \\ 6097 \\ \hline \end{array}$	$\begin{array}{r} 7604 \\ 4909 \\ \hline \end{array}$	$\begin{array}{r} 5003 \\ 3806 \\ \hline \end{array}$	$\begin{array}{r} 8460 \\ 7469 \\ \hline \end{array}$	$\begin{array}{r} 6080 \\ 5908 \\ \hline \end{array}$
4.	$\begin{array}{r} 9600 \\ 3097 \\ \hline \end{array}$	$\begin{array}{r} 7039 \\ 6799 \\ \hline \end{array}$	$\begin{array}{r} 6800 \\ 5009 \\ \hline \end{array}$	$\begin{array}{r} 7001 \\ 1903 \\ \hline \end{array}$	$\begin{array}{r} 4403 \\ 3040 \\ \hline \end{array}$
5.	$\begin{array}{r} 5004 \\ 3904 \\ \hline \end{array}$	$\begin{array}{r} 8040 \\ 4409 \\ \hline \end{array}$	$\begin{array}{r} 7409 \\ 3790 \\ \hline \end{array}$	$\begin{array}{r} 6400 \\ 4986 \\ \hline \end{array}$	$\begin{array}{r} 7002 \\ 6800 \\ \hline \end{array}$
6.	$\begin{array}{r} 8703 \\ 5008 \\ \hline \end{array}$	$\begin{array}{r} 6009 \\ 4939 \\ \hline \end{array}$	$\begin{array}{r} 8001 \\ 6809 \\ \hline \end{array}$	$\begin{array}{r} 5904 \\ 3400 \\ \hline \end{array}$	$\begin{array}{r} 9873 \\ 4980 \\ \hline \end{array}$
7.	$\begin{array}{r} 7003 \\ 4906 \\ \hline \end{array}$	$\begin{array}{r} 5900 \\ 3098 \\ \hline \end{array}$	$\begin{array}{r} 9204 \\ 8909 \\ \hline \end{array}$	$\begin{array}{r} 7405 \\ 6097 \\ \hline \end{array}$	$\begin{array}{r} 5900 \\ 4397 \\ \hline \end{array}$
8.	$\begin{array}{r} 8040 \\ 5787 \\ \hline \end{array}$	$\begin{array}{r} 6000 \\ 4349 \\ \hline \end{array}$	$\begin{array}{r} 5020 \\ 2345 \\ \hline \end{array}$	$\begin{array}{r} 4340 \\ 2367 \\ \hline \end{array}$	$\begin{array}{r} 9000 \\ 4989 \\ \hline \end{array}$
9.	$\begin{array}{r} 7504 \\ 6308 \\ \hline \end{array}$	$\begin{array}{r} 9786 \\ 5897 \\ \hline \end{array}$	$\begin{array}{r} 6340 \\ 4689 \\ \hline \end{array}$	$\begin{array}{r} 7200 \\ 4934 \\ \hline \end{array}$	$\begin{array}{r} 8069 \\ 5980 \\ \hline \end{array}$

1. Ralph had a collection of 4370 stamps and Arthur had 3745 stamps. How many more stamps did Ralph have than Arthur?

2. In the Central School there were 398 pupils; in the Garfield School, 1045; and in the Holmes School, 2306. How many pupils were there in the three schools?

3. John lived 5906 feet from school, and Thomas lived 2194 feet nearer the school than John. How far did Thomas live from school?

4. Ada counted the people in a parade. In the first group there were 208; in the second, 890; in the third, 1506; and in the fourth, 1781. How many were there in all? ✓

5. In two city schools, the boys paraded as soldiers. In the first school there were 1790 boys; in the second school there were 279 fewer boys than in the first. How many boys were there in the second school?

6. A merchant sold for the fourth of July, 3706 small flags, 1712 larger flags, and 19 flags for flag poles. How many flags did he sell?

7. John took 1370 steps to school and Paul took 940 fewer steps than John. How many steps did Paul take?

8. A street-car conductor collected 103 fares on the first trip, 72 on the second trip, 176 on the third trip, and 89 on the fourth trip. How many fares did he collect?

1. Add:

\$ 69.41
 33.58
 62.75
\$165.74

Add or subtract as before, and
 place the point in the answer
 under the other points.

2. Subtract:

\$ 547.58
 128.34
\$419.24

Add:

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
3.	\$ 32.45	\$ 50.75	\$ 32.11	\$ 321.65
	61.79	1.24	2.84	94.76
	8.15	6.19	16.31	8.92
	<u>23.42</u>	<u>83.72</u>	<u>5.49</u>	<u>143.74</u>
4.	\$ 35.18	\$ 85.24	\$ 21.89	\$ 86.42
	92.76	8.93	39.65	93.84
	9.84	16.82	84.21	2.69
	<u>26.37</u>	<u>73.25</u>	<u>16.93</u>	<u>39.87</u>

Subtract:

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
5.	\$ 275.43	\$ 536.75	\$ 408.37	\$ 674.26
	<u>167.35</u>	<u>308.28</u>	<u>276.58</u>	<u>210.75</u>
6.	\$ 682.72	\$ 826.45	\$ 527.05	\$ 763.72
	<u>79.80</u>	<u>60.76</u>	<u>89.98</u>	<u>140.80</u>
7.	\$ 869.50	\$ 721.80	\$ 800.00	\$ 700.00
	<u>678.85</u>	<u>643.55</u>	<u>589.36</u>	<u>476.85</u>
8.	\$ 423.75	\$ 521.00	\$ 900.00	\$ 600.00
	<u>246.95</u>	<u>239.94</u>	<u>746.75</u>	<u>489.58</u>

Read and add:

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
1.	\$ 246.25	\$ 632.75	\$ 327.56	\$ 805.96
	318.75	738.49	928.89	613.73
	92.48	918.86	738.86	928.45
	18.64	29.94	198.37	56.91
	<u>237.75</u>	<u>169.83</u>	<u>75.59</u>	<u>219.87</u>
2.	\$ 178.84	\$ 219.35	\$ 165.27	\$ 214.56
	6.92	7.29	86.15	3.94
	175.49	216.87	283.85	69.47
	862.81	938.75	395.94	138.85
	<u>219.97</u>	<u>139.49</u>	<u>415.86</u>	<u>475.27</u>
3.	\$ 465.75	\$ 37.28	\$ 692.37	\$ 475.84
	193.85	87.96	375.84	215.79
	276.49	29.49	49.86	936.93
	<u>475.98</u>	<u>18.07</u>	<u>126.92</u>	<u>214.85</u>

Subtract and test:

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
4.	\$ 475.36	\$ 435.24	\$ 438.64	\$ 821.42
	<u>196.28</u>	<u>178.95</u>	<u>195.73</u>	<u>195.38</u>
5.	\$ 317.61	\$ 124.15	\$ 326.47	\$ 412.49
	<u>219.84</u>	<u>95.76</u>	<u>158.96</u>	<u>273.89</u>
6.	\$ 246.37	\$ 235.55	\$ 831.02	\$ 903.05
	<u>174.75</u>	<u>169.73</u>	<u>567.89</u>	<u>395.48</u>

(Notice the groups that make 10 or 15.)

Add :

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>
1.	\$15.73	\$30.86	\$ 6.93	\$.48	\$.17
	6.98	15.29	32.63	2.75	.28
	.37	8.88	4.30	.76	5.70
	5.18	.68	12.51	5.85	16.37
	40.60	7.27	8.78	40.20	4.70
	5.89	23.85	.36	6.58	23.96
	.31	.25	.50	18 64	.85
	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>

2. Mr. Foster sold in 5 days as follows. Find each day's sales, total sales, and receipts for each article :

	MON.	TUES.	WED.	THURS.	FRI.
	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>
Corn,	\$75.25	\$68.75	\$27.35	\$87.45	\$64.65
Oats,	18.42	26.73	16.72	29.63	37.26
Bran,	6.75	3.75	8.25	7.75	9.45
Chop,	12.34	8.65	17.38	15.24	16.28
Meal,	3.60	5.40	7.60	12.60	17.20
Flour,	<u>47.25</u>	<u>68 25</u>	<u>78.75</u>	<u>89.25</u>	<u>110.25</u>

3. The deposits in a school savings bank in 7 months were as follows: \$145.75, \$123.34, \$134.89, \$645.75, \$800.05, \$900.25, \$845.52. How much was deposited in all?

4. My expenses for 6 days were \$1.42, \$2.05, \$2.36, \$2.12, \$1.45 and \$2.15. What were my total expenses for these six days?

Secure toy money, or make circles from cardboard to represent the different pieces.

Appoint storekeepers and purchasers, and have the counting done in the schoolroom.

1. Kate's purchase.

Sugar,	10¢
Butter,	15¢
Potatoes,	12¢
Cost,	<u>37¢</u>
Change,	1¢
	1¢
	1¢
	<u>10¢</u>
	50¢

The storekeeper,
when making the
change, says: "37,
38, 39, 40, 50."
Change, 13¢.

2. John's purchase.

Pencils,	15¢
Pens,	5¢
Ruler,	2¢
Pad,	20¢
Cost,	<u>42¢</u>
Change,	1¢
	1¢
	1¢
	<u>5¢</u>
	50¢

3. Philip bought meat for 30¢ and milk for 8¢.
How much change should he receive from 50¢?

Make change from 50¢ for:

- Oranges for 15¢, lemons for 8¢, pears for 5¢.
- Popcorn for 6¢, fruit for 10¢, nuts for 25¢.
- Rice for 8¢, tapioca for 15¢, prunes for 10¢.
- Potatoes for 15¢, bread for 8¢, turnips for 12¢.
- Plums for 20¢, sugar for 10¢, pepper for 8¢.
- Celery for 7¢, lettuce for 9¢, spinach for 12¢.
- Corn for 12¢, seed for 25¢, apples for 10¢.

Groceries

Make change from 25¢ for:

1. 2 lb. of rice at 8¢ a pound.
2. 1 cake of soap for 6¢.
3. $\frac{1}{2}$ lb. of nut butter at 34¢ a pound.
4. 2 boxes of stove polish at 10¢ each.
5. $\frac{1}{4}$ lb. of ginger at 40¢ a pound.

Dry Goods

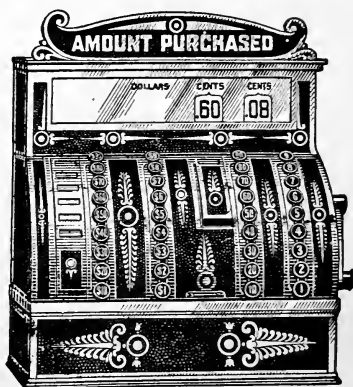
Make change from 50¢ for:

6. 3 collars at 10¢ each.
7. 4 yd. of lace at 8¢ a yard.
8. 3 doz. buttons at 15¢ a dozen.
9. 2 yd. of elastic at 8¢ a yard.

Meats

Make change from a dollar for:

10. 2 lb. of veal at 34¢ a pound.
11. 1 chicken for 87¢.
12. 2 lb. of chops at 30¢ a pound.
13. 2 lb. of steak at 45¢ a pound.



1. A boy's sales from his school garden were as follows: \$3.25, \$7.15, \$2.45, \$6.45, and \$8.79. What was the amount of his sales?

2. A boy's suit that was marked down from \$6.98 was sold for \$5.49. What was the reduction?

3. James had \$5.94; he spent \$2.75 for his mother's birthday gift. How much had he left?

4. What is the difference in the price of two hats marked \$4.50 and \$3.60?

5. The following amounts were deposited in the school savings bank: \$2.15, \$1.65, \$7.09, \$3.68, and \$9.15. What was the total of these deposits?

6. Mrs. Allen paid \$2.75 for a turkey, \$.30 for cranberries, \$.56 for butter, and \$.48 for coffee. What was the whole cost?

7. How many school badges 4 in. long can be made from 2 yd. of ribbon?

8. A clock that strikes the hours strikes how many strokes between one o'clock and six inclusive?

9. How many square inches are there in an 8-inch square?

10. There are 639 oranges in 9 baskets, with the same number in each. How many are there in each basket?

11. If you receive \$2.75, \$6.96, and \$8.15 and want to change it into five-dollar bills, how many should you get and how much money over?

1. A man paid \$2.50 for a hat and \$25.50 for a suit. How much did he pay for both?

$$\begin{array}{r} \$ 2.50, \text{ cost of hat} \\ \underline{25.50, \text{ cost of suit}} \\ \$28.00, \text{ cost of both} \end{array}$$

2. A farmer sold 425 bu. of potatoes, 232 bu. of apples, and 189 bu. of onions. Find the total number of bushels sold.

3. A lady paid \$25 for a carpet, \$71 for a rug, and \$7 for curtains. What was the amount of her bill?

4. How many days are there from July 1 through December 31?

5. A man left \$9845 to his wife, \$3650 to his son, and \$3500 to his daughter. How much did he leave to all three? *

6. John's father sold his house for \$5675, thereby losing \$897. How much did the house cost?

7. Arthur's vegetable garden is 30 ft. long and 24 ft. wide. How many feet is it around the garden?

8. The distance from New York to Philadelphia by rail is 92 miles and the distance from Philadelphia to Baltimore is 95 miles. How far is it from New York to Baltimore?

* Before solving, *estimate* the answer mentally thus: $\$10,000 + \$3500 + \$3500 = \$17,000$. Then find the exact answer, and compare the results. How much do they differ?

1. Show by adding ten 2's that $10 \times 2 = 20$; show by adding ten 3's that $10 \times 3 = 30$; and so on.

2. Count by 10's to 120. Build the table of 10's.

3. Place a zero to the right of 4. What number have you? 40 is how many times 4? Place a zero to the right of 6; 3; 7; 9; 11; 12. See whether each product has become ten times the number.

Annexing a zero to the right of a number multiplies it by 10.

4. Annex 0 to each number. Notice the effect:

4	20	36	75	42	87	275
93	87	692	387	509	938	765

5. Memorize this table:

$10 \times 1 = 10$	$10 \times 7 = 70$
$10 \times 2 = 20$	$10 \times 8 = 80$
$10 \times 3 = 30$	$10 \times 9 = 90$
$10 \times 4 = 40$	$10 \times 10 = 100$
$10 \times 5 = 50$	$10 \times 11 = 110$
$10 \times 6 = 60$	$10 \times 12 = 120$

6. Compare:

10×5 with 5×10
 8×10 with 10×8
 11×10 with 10×11
 120 and 12 110 and 11

Find the cost of:

- | | |
|-----------------------------|-----------------------------|
| 7. 10 newspapers at 5¢. | 11. 9 lb. lard at 10¢. |
| 8. 5 ladies' hats at \$ 10. | 12. 12 doz. buttons at 10¢. |
| 9. 10 oranges at 2 for 5¢. | 13. 10 qt. milk at 14¢. |
| 10. 10 yd. muslin at 12¢. | 14. 10 bu. tomatoes at 80¢. |

1. Beginning with 0 count by 10's to 100. Beginning with 1 count by 10's to 101.

2. 50 is how many times 5? How does 60 compare with 6? Remove the zero from 80. What is the result? 8 is what part of 80?

3. Remove the zero from 30; from 90; from 70. How does each result compare with the number?

4. 3 is what part of 30? $\frac{1}{10}$ of 30 = ? 4 is what part of 40? $\frac{1}{10}$ of 40 = ?

Removing a zero from the right of any number divides it by 10.

5. Divide by 10. Complete in two minutes.

40	30	90	80	60	100	120
320	520	980	750	360	470	920
1450	1680	2450	1930	2210	9990	7400
6320	4040	3100	2010	8500	7280	6900

6. How many 10-minute lesson periods are there in an hour?

7. At 10 cents a pound, how many pounds of sugar can be bought for 90 cents?

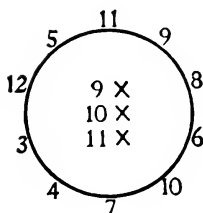
8. How long will it take a car, going 10 miles an hour, to travel 140 miles?

9. If I pay 50¢ for a telegram of 10 words, how much do I pay for each word?

1. Show by adding eleven 2's that $11 \times 2 = 22$; show by adding eleven 3's that $11 \times 3 = 33$; and so on.

2. Count by 11's to 132. Build the table of 11's.

3. $9 \times 11 = ?$ $10 \times 11 = ?$ $11 \times 11 = ?$



4. To find 12×11 how many must be added to 11×11 ? $12 \times 11 = ?$

5. Give the products:

$10 \times \$11$

$12 \times 11¢$

$5 \times 11 \text{ boys}$

$3 \times \$11$

$4 \times 11¢$

$8 \times 11 \text{ pens}$

$6 \times \$11$

$11 \times 9¢$

$11 \times 7 \text{ days}$

6. Memorize this table:

$11 \times 1 = 11$

$11 \times 7 = 77$

$11 \times 2 = 22$

$11 \times 8 = 88$

$11 \times 3 = 33$

$11 \times 9 = 99$

$11 \times 4 = 44$

$11 \times 10 = 110$

$11 \times 5 = 55$

$11 \times 11 = 121$

$11 \times 6 = 66$

$11 \times 12 = 132$

7. Compare:

$11 \times 7 \text{ with } 7 \times 11$

$9 \times 11 \text{ with } 11 \times 9$

$11 \times 4 \text{ with } 4 \times 11$

$12 \times 11 \text{ with } 11 \times 12$

$6 \times 11 \text{ with } 11 \times 6$

8. Find the products:

11×60

11×80

11×40

11×100

$11 \times \$35$

11×90

11×50

11×20

11×45

$11 \times \$25$

11×13

11×30

11×70

11×15

$11 \times \$18$

9. Find the cost of 11 pads at 9¢ each; at 11¢ each; at 12¢ each.

1. Show by adding twelve 2's that $12 \times 2 = 24$; show by adding twelve 3's that $12 \times 3 = 36$; and so on.

2. Count by 12's to 144. Build the table of 12's.

3. Memorize this table:

$12 \times 1 = 12$	$12 \times 7 = 84$
$12 \times 2 = 24$	$12 \times 8 = 96$
$12 \times 3 = 36$	$12 \times 9 = 108$
$12 \times 4 = 48$	$12 \times 10 = 120$
$12 \times 5 = 60$	$12 \times 11 = 132$
$12 \times 6 = 72$	$12 \times 12 = 144$

4. Multiply by 12; by 11:

465	236	789
546	783	928
784	937	693
785	514	938
978	694	296

1 dozen = 12 1 gross = 144

5. What two numbers make the following products?

25	27	28	30	32	35	36	40	42	45	48
49	56	60	63	64	66	72	80	84	88	96

Multiply by 12:

a ✓	b	c	d	e
6. 152 nuts	\$264	371¢	468	156
7. 384 trees	\$780	529¢	795	579
8. 291 ships	\$231	604¢	405	234

9. How many eggs are there in 612 boxes, each containing one dozen?

10. Find the weight of 12 barrels of flour, each weighing 196 pounds.

1. Subtract by 11's from 132 to 0.

2. Give the quotients and the remainders:

$33 \div 11$	$66 \div 11$	$88 \div 11$	$132 \div 11$
$44 \div 11$	$77 \div 11$	$99 \div 11$	$121 \div 11$
$48 \div 11$	$60 \div 11$	$73 \div 11$	$118 \div 11$

3. Find $\frac{1}{11}$ of: 99; 22; 55; 110; 132; 121.

Divide by 11 and test:

4. 2739	7. 6952	10. 8921	13. 69,751
5. 8294	8. 3982	11. 2156	14. 73,062
6. 2035	9. 3003	12. 8052	15. 90,090

16. Subtract by 12's from 144 to 0.

17. Give the quotients and the remainders:

$\$36 \div 12$	$60¢ \div 12$	$84 \div 12$	$132 \div 12$
$\$26 \div 12$	$97¢ \div 12$	$112 \div 12$	$140 \div 12$

18. Find $\frac{1}{12}$ of: 96; 84; 72; 36; 108; 24; 120; 132; 60; 48; 144.

Divide by 12 and test:

19. 3672	24. 7812	29. 42,192	34. 91,872
20. 4860	25. 2844	30. 69,372	35. 24,720
21. 6960	26. 9228	31. 73,944	36. 68,352
22. 7224	27. 4680	32. 82,656	37. 81,768
23. 4692	28. 9384	33. 37,296	38. 92,364

1. Divide 345 by 2.

Think :

Hundreds. 2 in 3, 1, with 1 r.

Write 1.

Tens. 2 in 14, 7. Write 7.

Ones. 2 in 5, 2, with 1 r.

$$\begin{array}{r} 2 \overline{)345} \\ 172; \text{ r. } 1 \end{array}$$

The answer is read "one hundred seventy-two, with 1 r." The abbreviation r. stands for remainder.

Divide:

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
2. 789 by 2	284 by 3	793 by 2	3940 by 7
3. 465 by 4	500 by 7	875 by 6	1945 by 4
4. 297 by 5	278 by 5	700 by 3	2378 by 3

5. Divide 461 by 2.

$$\begin{array}{r} 2 \overline{)461} \\ 230; \text{ r. } 1 \end{array}$$

Test. If the answer is correct, then 2×230 or 460, + 1, the remainder, will equal 461, the dividend.

Divide by 2 and test; by 3:

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>
6. 265	864	786	624	7368
7. 713	219	269	578	2457

Divide by 4 and test; by 5:

8. 268	936	6981	3874	4876
9. 864	468	5034	2190	3841
10. 225	338	2021	3000	2999

1 × 1 = 1	2 × 1 = 2	3 × 1 = 3	4 × 1 = 4
1 × 2 = 2	2 × 2 = 4	3 × 2 = 6	4 × 2 = 8
1 × 3 = 3	2 × 3 = 6	3 × 3 = 9	4 × 3 = 12
1 × 4 = 4	2 × 4 = 8	3 × 4 = 12	4 × 4 = 16
1 × 5 = 5	2 × 5 = 10	3 × 5 = 15	4 × 5 = 20
1 × 6 = 6	2 × 6 = 12	3 × 6 = 18	4 × 6 = 24
1 × 7 = 7	2 × 7 = 14	3 × 7 = 21	4 × 7 = 28
1 × 8 = 8	2 × 8 = 16	3 × 8 = 24	4 × 8 = 32
1 × 9 = 9	2 × 9 = 18	3 × 9 = 27	4 × 9 = 36
1 × 10 = 10	2 × 10 = 20	3 × 10 = 30	4 × 10 = 40
1 × 11 = 11	2 × 11 = 22	3 × 11 = 33	4 × 11 = 44
1 × 12 = 12	2 × 12 = 24	3 × 12 = 36	4 × 12 = 48
5 × 1 = 5	6 × 1 = 6	7 × 1 = 7	8 × 1 = 8
5 × 2 = 10	6 × 2 = 12	7 × 2 = 14	8 × 2 = 16
5 × 3 = 15	6 × 3 = 18	7 × 3 = 21	8 × 3 = 24
5 × 4 = 20	6 × 4 = 24	7 × 4 = 28	8 × 4 = 32
5 × 5 = 25	6 × 5 = 30	7 × 5 = 35	8 × 5 = 40
5 × 6 = 30	6 × 6 = 36	7 × 6 = 42	8 × 6 = 48
5 × 7 = 35	6 × 7 = 42	7 × 7 = 49	8 × 7 = 56
5 × 8 = 40	6 × 8 = 48	7 × 8 = 56	8 × 8 = 64
5 × 9 = 45	6 × 9 = 54	7 × 9 = 63	8 × 9 = 72
5 × 10 = 50	6 × 10 = 60	7 × 10 = 70	8 × 10 = 80
5 × 11 = 55	6 × 11 = 66	7 × 11 = 77	8 × 11 = 88
5 × 12 = 60	6 × 12 = 72	7 × 12 = 84	8 × 12 = 96
9 × 1 = 9	10 × 1 = 10	11 × 1 = 11	12 × 1 = 12
9 × 2 = 18	10 × 2 = 20	11 × 2 = 22	12 × 2 = 24
9 × 3 = 27	10 × 3 = 30	11 × 3 = 33	12 × 3 = 36
9 × 4 = 36	10 × 4 = 40	11 × 4 = 44	12 × 4 = 48
9 × 5 = 45	10 × 5 = 50	11 × 5 = 55	12 × 5 = 60
9 × 6 = 54	10 × 6 = 60	11 × 6 = 66	12 × 6 = 72
9 × 7 = 63	10 × 7 = 70	11 × 7 = 77	12 × 7 = 84
9 × 8 = 72	10 × 8 = 80	11 × 8 = 88	12 × 8 = 96
9 × 9 = 81	10 × 9 = 90	11 × 9 = 99	12 × 9 = 108
9 × 10 = 90	10 × 10 = 100	11 × 10 = 110	12 × 10 = 120
9 × 11 = 99	10 × 11 = 110	11 × 11 = 121	12 × 11 = 132
9 × 12 = 108	10 × 12 = 120	11 × 12 = 132	12 × 12 = 144

1. Annex a zero to the right of 3; then multiply 3 by 10. Is there any difference in the result?

Annexing a zero to the right of a number multiplies it by 10.

2. Multiply by 10: 40; 20; 60; 800; 300; 700.

3. Multiply 3 by 100; 8 by 100; 9 by 100; 20 by 100. How many times as large has each of the numbers become? How many zeros were added to each?

Annexing two zeros to the right of a number multiplies it by 100.

4. Find the products:

100×4	100×15	100×50	100×75
100×5	100×37	100×91	100×36

5. Multiply 3 by 1000. How many zeros did you annex to 3? Multiply 6 by 1000. How many zeros did you annex to 6? Multiply 8 by 1000; 9 by 1000. How many times as large has each number become?

Annexing three zeros to the right of a number multiplies it by 1000.

6. From what you have learned, make a rule for multiplying any number by 10; by 100; by 1000.

7. Multiply:

2 by 1000; 7 by 1000; 5 by 1000; 4 by 1000; 25 by 100; 36 by 10; 72 by 10; 72 by 100; 72 by 1000.

1. How many cents are there in 100 dimes?
2. How many cents are there in \$6?

Find the weight of:

3. 100 two-pound packages of rolled oats.
4. 100 five-pound boxes of starch.
5. 25 one-hundred-pound kegs of nails.
6. 100 lambs at an average of 45 lb. each.
7. Find the cost of 100 two-cent picture postcards and 100 three-cent stamps.
8. Multiply 63 by 200.

Write the 2 of the multiplier under the figure
 63 in ones' place of the multiplicand. $2 \times 63 = 126$.
 200 Annex two zeros to the right of 126,
 12600 making 12600. $100 \times 63 = 6300$; $200 \times 63 =$
 12600.

Multiply:

- | | | | |
|---|--|---|---|
| 9. $\begin{array}{r} 71 \\ \underline{200} \end{array}$ | 10. $\begin{array}{r} 85 \\ \underline{300} \end{array}$ | 11. $\begin{array}{r} 245 \\ \underline{400} \end{array}$ | 12. $\begin{array}{r} 715 \\ \underline{700} \end{array}$ |
| 13. 347 by 20 | 18. 293 by 500 | 23. 481 by 200 | |
| 14. 409 by 30 | 19. 786 by 700 | 24. 894 by 400 | |
| 15. 715 by 60 | 20. 184 by 400 | 25. 906 by 700 | |
| 16. 329 by 80 | 21. 796 by 600 | 26. 728 by 900 | |
| 17. 475 by 90 | 22. 832 by 200 | 27. 365 by 120 | |

1. Divide 60 by 10. Remove 0 from 60.
2. Compare 60 and 6; 40 and 4; 30 and 3. What effect has the removing of one zero from the right of a number upon the value of the number?
3. Divide by 10: 20; 900; 350; 470; 530; 260.
4. Divide 600 by 100. Remove two zeros from 600. Compare 900 divided by 100 with $900 \div 100$. What effect has the removing of two zeros from the right of a number upon the value of the number?
5. Compare $3000 \div 1000$ with $3000 \div 1000$. Compare $9000 \div 1000$ with $9000 \div 1000$. How many zeros are removed from the right of 3000 when it is divided by 1000? from the right of 9000? What effect has the removing of three zeros from the right of a number upon the number?

Removing one zero from the right of a number divides the number by 10; removing two zeros divides it by 100; removing three zeros divides it by 1000, etc.

Find the quotients:

- | | | |
|------------------|--------------------|----------------------|
| 6. $30 \div 10$ | 10. $300 \div 100$ | 14. $4000 \div 1000$ |
| 7. $90 \div 10$ | 11. $600 \div 100$ | 15. $5000 \div 1000$ |
| 8. $70 \div 10$ | 12. $700 \div 100$ | 16. $9000 \div 1000$ |
| 9. $200 \div 10$ | 13. $900 \div 100$ | 17. $7000 \div 1000$ |

$24 \div 6 = 4$. Divide both dividend and divisor by 3. Then $8 \div 2 = 4$.

Show also that $36 \div 9 = 12 \div 3$.

Dividing both dividend and divisor by the same number does not alter the quotient.

1. Divide 1460 by 20.

$$\begin{array}{r} 20 \overline{)1460} \\ 73 \end{array}$$

$$\begin{array}{r} 200 \overline{)14600} \\ 73 \end{array}$$

Removing one zero, or the same number of zeros, from *both dividend and divisor* does not change the quotient, since it is the same as dividing

both dividend and divisor by the same number.

Find the quotients:

2. $80 \div 20$

6. $900 \div 100$

10. $12,000 \div 1000$

3. $60 \div 30$

7. $1000 \div 100$

11. $12,000 \div 2000$

4. $90 \div 10$

8. $6000 \div 200$

12. $18,000 \div 3000$

5. $40 \div 20$

9. $8400 \div 400$

13. $16,000 \div 4000$

14. How many 10-gallon cans will a dealer use in shipping 200 gallons of milk?

15. How many 20-pound packages can be made from 1000 pounds of coffee?

16. 2000 pounds of crackers were shipped in 400 boxes. How many pounds did each box contain?

17. How many \$20 coats were sold for \$2400?

18. A man bought a house for \$3500. How many months will it take to pay for it at \$100 a month?

Give the quotients:

19. $160 \div 40$

23. $200 \div 50$

27. $750 \div 15$

20. $360 \div 30$

24. $480 \div 80$

28. $300 \div 60$

21. $900 \div 90$

25. $480 \div 60$

29. $250 \div 25$

22. $750 \div 30$

26. $220 \div 110$

30. $600 \div 50$

1. Multiply 64 by 23.

		SHORT FORM
Multiplicand,	64	64
Multiplier,	23	23
1st partial product,	192 = 3 × 64	192
2d partial product,	1280 = 20 × 64	128
Entire product,	1472 = 23 × 64	1472

In practice the 0 in the second partial product is omitted, and 1280 is written as 128 *tens* by placing the right-hand figure of that product in *tens'* place.

The number multiplied is called the **multiplicand**.

The number showing how many times the multiplicand is taken is called the **multiplier**.

The result in multiplication is called the **product**.

2.	3.	4.	5.
327	203	6004	3060
35	42	73	89
<u>1635</u>	<u>406</u>	<u>18012</u>	<u>27540</u>
981	812	42028	24480
<u>11445</u>	<u>8526</u>	<u>438292</u>	<u>272340</u>

Multiply:

$\checkmark a$	b	c	d	e
6. 603	645	863	765	806
24	32	24	35	43
<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
7. 908	306	609	967	867
23	76	79	47	39
<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
8. 200	300	706	659	908
56	49	87	69	79
<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>

Multiply:

- | | | |
|--------------|---------------|----------------|
| 1. 426 by 23 | 10. 634 by 37 | 19. 9006 by 48 |
| 2. 372 by 41 | 11. 298 by 73 | 20. 2694 by 75 |
| 3. 256 by 33 | 12. 604 by 48 | 21. 8002 by 38 |
| 4. 307 by 32 | 13. 729 by 40 | 22. 4293 by 67 |
| 5. 269 by 43 | 14. 903 by 86 | 23. 9128 by 39 |
| 6. 307 by 27 | 15. 694 by 79 | 24. 2807 by 74 |
| 7. 538 by 36 | 16. 928 by 89 | 25. 6293 by 56 |
| 8. 736 by 63 | 17. 726 by 75 | 26. 4060 by 13 |
| 9. 487 by 52 | 18. 349 by 28 | 27. 2734 by 27 |

Give the products rapidly:

- | <i>a</i> | <i>b</i> | <i>c</i> | <i>d</i> |
|--------------------|----------------|----------------|----------------|
| 28. 50×90 | 20×20 | 60×60 | 20×80 |
| 29. 80×70 | 30×30 | 70×70 | 40×30 |
| 30. 90×70 | 40×40 | 80×80 | 70×60 |
| 31. 60×50 | 50×50 | 90×90 | 70×40 |

Multiply:

- | | | |
|---------------|----------------|----------------|
| 32. 463 by 73 | 34. 9869 by 84 | 36. 8693 by 28 |
| 33. 938 by 84 | 35. 3278 by 93 | 37. 9281 by 39 |

38. Our teacher ordered 288 pads. Each pad contained 48 sheets of paper. How many sheets did she have?

39. An airplane averaged 109 miles an hour. How far did it fly in 17 hours?

1. Multiply 694 by 326.

$$\begin{array}{r}
 694 \\
 326 \\
 \hline
 4164 = 6 \times 694 \\
 13880 = 20 \times 694 \\
 208200 = 300 \times 694 \\
 226244 = 326 \times 694
 \end{array}$$

SHORT FORM

$$\begin{array}{r}
 694 \\
 326 \\
 \hline
 4164 \\
 1388 \\
 2082 \\
 \hline
 226244
 \end{array}$$

When multiplying by 3 hundreds, write the partial product as 2082 *hundreds* by placing the first figure of that product under *hundreds*.

Multiply:

$$\begin{array}{r}
 2. \quad 462 \\
 \quad 375 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 4. \quad 283 \\
 \quad 243 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 6. \quad 619 \\
 \quad 128 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 8. \quad 543 \\
 \quad 264 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 3. \quad 475 \\
 \quad 325 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 5. \quad 267 \\
 \quad 364 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 7. \quad 387 \\
 \quad 918 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 9. \quad 476 \\
 \quad 842 \\
 \hline
 \end{array}$$

$$10. \quad 465 \text{ by } 327$$

$$15. \quad 538 \text{ by } 147$$

$$20. \quad 467 \text{ by } 275$$

$$11. \quad 289 \text{ by } 943$$

$$16. \quad 249 \text{ by } 316$$

$$21. \quad 839 \text{ by } 843$$

$$12. \quad 568 \text{ by } 769$$

$$17. \quad 987 \text{ by } 827$$

$$22. \quad 761 \text{ by } 972$$

$$13. \quad 987 \text{ by } 938$$

$$18. \quad 734 \text{ by } 695$$

$$23. \quad 398 \text{ by } 867$$

$$14. \quad 478 \text{ by } 783$$

$$19. \quad 938 \text{ by } 783$$

$$24. \quad 485 \text{ by } 984$$

25. One barrel of flour contains 196 pounds. How many pounds do 125 barrels contain?

26. There are 158 schools in a county, with an average of 268 pupils each. How many pupils are there in the county?

1. Multiply 273 by 304.

$$\begin{array}{r}
 273 \\
 304 \\
 \hline
 1092 = 4 \times 273 \\
 81900 = 300 \times 273 \\
 82992 = 304 \times 273
 \end{array}$$

SHORT FORM

$$\begin{array}{r}
 273 \\
 304 \\
 \hline
 1092 \\
 819 \\
 \hline
 82992
 \end{array}$$

Work in the short form, omitting the zeros in units and tens in the second partial product.

When multiplying by 3 hundreds, write the partial product as 819 *hundreds* by placing the right-hand figure of that product in *hundreds'* place.

Multiply:

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>
2.	316	275	428	506	709
	<u>502</u>	<u>306</u>	<u>405</u>	<u>307</u>	<u>508</u>
3.	243	709	608	705	908
	<u>308</u>	<u>504</u>	<u>209</u>	<u>804</u>	<u>607</u>

4. In ex. 5 below, which number used as multiplier would require fewer partial products? which number in ex. 7? in ex. 8? in ex. 13? in ex. 15?

5. Multiply 278 by 480.

$$\begin{array}{r}
 278 \\
 480 \\
 \hline
 22240 \\
 1112 \\
 \hline
 133440
 \end{array}$$

- | | |
|--------------------------|--------------------------|
| 6. $746 \times 359 = ?$ | 11. $500 \times 358 = ?$ |
| 7. $296 \times 480 = ?$ | 12. $220 \times 842 = ?$ |
| 8. $374 \times 240 = ?$ | 13. $751 \times 600 = ?$ |
| 9. $604 \times 347 = ?$ | 14. $304 \times 509 = ?$ |
| 10. $200 \times 569 = ?$ | 15. $907 \times 800 = ?$ |

Answer rapidly :

1. $\begin{array}{r} 2 \overline{)32} \end{array}$ $\begin{array}{r} 3 \overline{)48} \end{array}$ $\begin{array}{r} 4 \overline{)44} \end{array}$ $\begin{array}{r} 5 \overline{)35} \end{array}$ $\begin{array}{r} 5 \overline{)75} \end{array}$

2. $\begin{array}{r} 6 \overline{)72} \end{array}$ $\begin{array}{r} 7 \overline{)147} \end{array}$ $\begin{array}{r} 8 \overline{)872} \end{array}$ $\begin{array}{r} 9 \overline{)3699} \end{array}$ $\begin{array}{r} 8 \overline{)4056} \end{array}$

3. $\frac{1}{2}$ of 16; 18; 26; 28; 32; 36; 40.

4. $\frac{1}{3}$ of 24; 27; 36; 18; 60; 90; 120.

5. $\frac{1}{4}$ of 48; 24; 60; 72; 36; 44; 56.

6. $\frac{1}{5}$ of 60; 55; 100; 150; 75; 45; 65.

7. $\frac{1}{6}$ of 72; 96; 84; 24; 48; 240; 36.

8. $\frac{1}{7}$ of 84; 91; 49; 63; 105; 350; 2100.

9. $\frac{1}{8}$ of 96; 72; 640; 960; 560; 120; 880.

10. $\frac{1}{9}$ of 54; 135; 360; 720; 108; 7209; 1080.

11. $\frac{1}{10}$ of 100; 120; 130; 190; 1250; 1950; 1780.

12. $\frac{1}{11}$ of 77; 88; 99; 132; 1100; 1320; 1210.

13. $\frac{1}{12}$ of 96; 84; 144; 288; 960; 840; 1080.

Divide and test :

14. $\begin{array}{r} 11 \overline{)6303} \end{array}$ $\begin{array}{r} 11 \overline{)2243} \end{array}$ $\begin{array}{r} 11 \overline{)2882} \end{array}$ $\begin{array}{r} 11 \overline{)6699} \end{array}$

15. $\begin{array}{r} 12 \overline{)96840} \end{array}$ $\begin{array}{r} 12 \overline{)89640} \end{array}$ $\begin{array}{r} 12 \overline{)6072} \end{array}$ $\begin{array}{r} 12 \overline{)9060} \end{array}$

Give the quotients rapidly :

16. $\begin{array}{r} 8 \overline{)96} \end{array}$ $\begin{array}{r} 9 \overline{)72} \end{array}$ $\begin{array}{r} 10 \overline{)190} \end{array}$ $\begin{array}{r} 11 \overline{)121} \end{array}$ $\begin{array}{r} 12 \overline{)96} \end{array}$

1. Divide 240 by 15.

$$\begin{array}{r}
 16, \text{ Quotient} \\
 \text{Divisor, } 15 \overline{)240}, \text{ Dividend} \\
 \underline{15} \\
 90 \\
 \underline{90}
 \end{array}$$

In long division the quotient is placed *over* the dividend.

15 is contained in 24, 1 time.

Write **1** in the quotient, *directly over* 4.

Multiply 15 by 1, placing the product, 15, under 24.

Subtract 15 from 24. The remainder is 9.

Bring down the next figure, 0. 15 is contained in 90, 6 times. Write **6** in the quotient, *directly over* 0.

Multiply 15 by 6, placing the product, 90, under 90.

As there is no remainder, the quotient is 16.

The number divided is called the **dividend**.

The number by which we divide is called the **divisor**.

The answer in division is called the **quotient**.

Divide:

$$\begin{array}{r}
 21 \\
 2. \ 13 \overline{)273} \\
 \underline{26} \\
 13 \\
 \underline{13}
 \end{array}$$

$$\begin{array}{r}
 28 \\
 3. \ 21 \overline{)588} \\
 \underline{42} \\
 168 \\
 \underline{168}
 \end{array}$$

$$\begin{array}{r}
 22 \\
 4. \ 23 \overline{)506} \\
 \underline{46} \\
 46 \\
 \underline{46}
 \end{array}$$

STEPS IN EX. 4

1. Divide 50 by 23.

4. Subtract 46 from 50.

2. Write quotient figure.

5. Bring down next figure.

3. Multiply 23 by 2.

Test. $23 \times 22 = 506$

5. Divide 441 by 21; 672 by 21; 903 by 21.

Think how many times the first figure of the divisor is contained in the first figure of the dividend. The number will be the first figure of the quotient.

- | | | |
|------------------|------------------|-------------------|
| 1. $252 \div 21$ | 4. $714 \div 21$ | 7. $504 \div 21$ |
| 2. $525 \div 21$ | 5. $651 \div 21$ | 8. $2398 \div 21$ |
| 3. $861 \div 21$ | 6. $357 \div 21$ | 9. $2625 \div 21$ |

Think how many times the first figure of the divisor is contained in the first figure, or in the first two figures, of the dividend. The number will be the first figure of the quotient.

- | | | |
|--------------------|--------------------|--------------------|
| 10. $713 \div 31$ | 14. $7176 \div 23$ | 18. $6930 \div 33$ |
| 11. $899 \div 31$ | 15. $9476 \div 23$ | 19. $1984 \div 32$ |
| 12. $6727 \div 31$ | 16. $5028 \div 42$ | 20. $2272 \div 32$ |
| 13. $8323 \div 41$ | 17. $1344 \div 42$ | 21. $1683 \div 51$ |

22. Divide 819 by 21.

$\begin{array}{r} 4 \\ 21 \overline{)819} \\ \underline{84} \end{array}$	<p>Since the product of the divisor and quotient is greater than 81, the quotient figure is <i>too large</i>. Try a smaller quotient figure.</p>	$\begin{array}{r} 39 \\ 21 \overline{)819} \\ \underline{63} \\ 189 \\ \underline{189} \end{array}$
--	--	---

23. Divide 651 by 21.

$\begin{array}{r} 2 \\ 21 \overline{)651} \\ \underline{42} \\ 23 \end{array}$	<p>Since the remainder is greater than the divisor, the quotient figure is <i>too small</i>. Try a larger quotient figure.</p>	$\begin{array}{r} 31 \\ 21 \overline{)651} \\ \underline{63} \\ 21 \\ \underline{21} \end{array}$
--	--	---

Divide and test:

- | | | |
|--------------------------|---------------------------|---------------------------|
| 1. $21 \overline{)882}$ | 17. $31 \overline{)775}$ | 33. $42 \overline{)1008}$ |
| 2. $21 \overline{)903}$ | 18. $31 \overline{)744}$ | 34. $42 \overline{)1596}$ |
| 3. $21 \overline{)504}$ | 19. $31 \overline{)899}$ | 35. $42 \overline{)1680}$ |
| 4. $21 \overline{)819}$ | 20. $31 \overline{)217}$ | 36. $42 \overline{)1722}$ |
| 5. $21 \overline{)315}$ | 21. $32 \overline{)672}$ | 37. $43 \overline{)1333}$ |
| 6. $21 \overline{)567}$ | 22. $32 \overline{)928}$ | 38. $43 \overline{)6880}$ |
| 7. $21 \overline{)399}$ | 23. $32 \overline{)160}$ | 39. $43 \overline{)9460}$ |
| 8. $21 \overline{)441}$ | 24. $32 \overline{)192}$ | 40. $43 \overline{)1376}$ |
| 9. $22 \overline{)880}$ | 25. $33 \overline{)462}$ | 41. $51 \overline{)1683}$ |
| 10. $22 \overline{)638}$ | 26. $33 \overline{)858}$ | 42. $51 \overline{)3672}$ |
| 11. $22 \overline{)352}$ | 27. $33 \overline{)561}$ | 43. $51 \overline{)3264}$ |
| 12. $22 \overline{)660}$ | 28. $33 \overline{)627}$ | 44. $51 \overline{)1428}$ |
| 13. $23 \overline{)575}$ | 29. $41 \overline{)943}$ | 45. $52 \overline{)1508}$ |
| 14. $23 \overline{)736}$ | 30. $41 \overline{)2296}$ | 46. $52 \overline{)2288}$ |
| 15. $23 \overline{)966}$ | 31. $41 \overline{)1107}$ | 47. $53 \overline{)2385}$ |
| 16. $23 \overline{)138}$ | 32. $41 \overline{)1435}$ | 48. $53 \overline{)1908}$ |

49. If a bushel of oats weighs 32 lb., how many bushels will weigh 28,640 lb.?

50. How long will it take a train that travels 31 miles an hour to go a distance of 279 miles?

51. How many hours are there in 840 minutes?

52. There are 32 quarts in a bushel. How many bushels are there in 6912 quarts?

1. Divide 7410 by 28.

$$\begin{array}{r}
 264; \text{ r. } 18 \\
 28 \overline{)7410} \\
 \underline{56} \\
 181 \\
 \underline{168} \\
 130 \\
 \underline{112} \\
 18
 \end{array}$$

NOTE. Since 28 is nearly 30, we may find the first figure more easily by dividing by 3 than by 2.

The quotient is 264 and the remainder, 18.

$$\begin{array}{l}
 \text{Test. } 28 \times 264 = 7392; \\
 7392 + 18 = 7410.
 \end{array}$$

Divide and test:

- | | | |
|----------------|-----------------------|----------------|
| 2. 2397 by 51 | 11. 2542 by 41 | 20. 2058 by 27 |
| 3. 3888 by 86 | 12. 3567 by 87 | 21. 2668 by 31 |
| 4. 1302 by 21 | 13. 1281 by 21 | 22. 3592 by 43 |
| 5. 2945 by 38 | 14. 1703 by <u>27</u> | 23. 2047 by 83 |
| 6. 3213 by 13 | 15. 3034 by 46 | 24. 6938 by 94 |
| 7. 1827 by 27 | 16. 4697 by 61 | 25. 7159 by 39 |
| 8. 3007 by 36 | 17. 4368 by 98 | 26. 4918 by 94 |
| 9. 6256 by 81 | 18. 4544 by 76 | 27. 8168 by 86 |
| 10. 5096 by 95 | 19. 2867 <u>by</u> 61 | 28. 8925 by 28 |

29. Find the number of barrels of oil, 51 gallons each, that can be filled from a vessel containing 408 gallons.

30. How many barrels, of 51 gallons each, can be filled from a vessel containing 412 gallons and how many gallons will be left over?

31. How many buildings, 75 ft. wide, can be erected on a street 300 ft. long?

1. Divide 13,892 by 23.

$$\begin{array}{r}
 604 \\
 23 \overline{)13892} \\
 \underline{138} \\
 92 \\
 \underline{92} \\
 0
 \end{array}$$

What is the product of 6×23 ?
Is there any remainder?

What is the next operation?

Does 9 contain 23? Since 9 does not contain 23, write 0 in the quotient, and bring down 2, making the number to be divided 92.

Find the quotients and test:

- | | | |
|---------------------|----------------------|----------------------|
| 2. $26,322 \div 46$ | 9. $23,229 \div 29$ | 16. $56,079 \div 73$ |
| 3. $31,356 \div 39$ | 10. $73,784 \div 92$ | 17. $45,825 \div 65$ |
| 4. $23,641 \div 47$ | 11. $15,631 \div 77$ | 18. $19,844 \div 49$ |
| 5. $33,522 \div 37$ | 12. $36,792 \div 73$ | 19. $19,266 \div 38$ |
| 6. $31,590 \div 45$ | 13. $58,056 \div 82$ | 20. $83,396 \div 98$ |
| 7. $49,248 \div 81$ | 14. $67,596 \div 74$ | 21. $41,157 \div 51$ |
| 8. $20,130 \div 66$ | 15. $16,685 \div 54$ | 22. $15,100 \div 25$ |

Give the quotients rapidly:

- | | | |
|-------------------|-------------------|------------------|
| 23. $64 \div 32$ | 30. $200 \div 20$ | 37. $90 \div 15$ |
| 24. $96 \div 48$ | 31. $70 \div 35$ | 38. $60 \div 20$ |
| 25. $40 \div 20$ | 32. $45 \div 15$ | 39. $48 \div 24$ |
| 26. $50 \div 25$ | 33. $46 \div 23$ | 40. $56 \div 28$ |
| 27. $60 \div 30$ | 34. $56 \div 28$ | 41. $63 \div 21$ |
| 28. $90 \div 45$ | 35. $99 \div 33$ | 42. $84 \div 21$ |
| 29. $100 \div 50$ | 36. $64 \div 32$ | 43. $62 \div 31$ |

Multiply and test:

- | | | |
|---------|--------|-------|
| 1. 8465 | } by { | a. 22 |
| 2. 7645 | | b. 45 |
| 3. 8741 | | c. 50 |
| 4. 9860 | | d. 86 |
| 5. 8425 | | e. 76 |
| 6. 9654 | | f. 98 |
| 7. 7869 | | g. 56 |
| 8. 9765 | | h. 69 |

Form 8 groups of 8 examples each by multiplying each multiplicand by each multiplier, thus:

$$1 a. 22 \times 8465 = ?$$

$$1 d. 86 \times 8465 = ?$$

$$6 e. 76 \times 9654 = ?$$

NOTE. The teacher may assign a different group to each of 8 class teams and notice which team makes the best record for speed and accuracy.

9. Divide 969 by 23.

$$\begin{array}{r} 42; r. 3 \\ 23 \overline{)969} \\ \underline{92} \\ 49 \\ \underline{46} \\ 3 \end{array}$$

Test. $23 \times 42 = 966$; $966 + 3 = 969$

10. Divide 969 by 24.

$$\begin{array}{r} 40; r. 9 \\ 24 \overline{)969} \\ \underline{96} \\ 9 \end{array}$$

Divide and test:

- | | | |
|------------|--------|-------|
| 11. 84,765 | } by { | a. 86 |
| 12. 57,672 | | b. 78 |
| 13. 80,720 | | c. 91 |
| 14. 50,724 | | d. 59 |
| 15. 60,925 | | e. 72 |
| 16. 86,412 | | f. 67 |
| 17. 76,412 | | g. 82 |
| 18. 83,456 | | h. 65 |

Form 8 groups of 8 examples each by dividing each of the dividends by each of the divisors, thus:

$$11 a. 84,765 \div 86 = ?$$

$$16 e. 86,412 \div 72 = ?$$

NOTE. The teacher may assign these groups to 8 class teams, as above.

19. A dairy company owned 225 cows valued at \$19,125. What was the average value of each cow?

20. At \$48 each how many calves could be bought for \$10,992?

Give the quotients rapidly :

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
1. $100 \div 10$	$280 \div 140$	$993 \div 331$	$315 \div 105$
2. $500 \div 50$	$930 \div 310$	$645 \div 129$	$972 \div 324$
3. $300 \div 30$	$860 \div 172$	$951 \div 317$	$725 \div 145$
4. $250 \div 50$	$396 \div 132$	$284 \div 142$	$932 \div 466$
5. $400 \div 80$	$960 \div 320$	$788 \div 197$	$260 \div 130$
6. $844 \div 211$	$990 \div 330$	$882 \div 126$	$775 \div 155$
7. Divide 175,608 by 324. 8. Divide 793,320 by 264.			

$$\begin{array}{r}
 542 \\
 324 \overline{)175608} \\
 \underline{1620} \\
 1360 \\
 \underline{1296} \\
 648 \\
 \underline{648} \\
 0
 \end{array}$$

$$\begin{array}{r}
 3005 \\
 264 \overline{)793320} \\
 \underline{792} \\
 1320 \\
 \underline{1320} \\
 0
 \end{array}$$

Since 264 is larger than 13 and than 132, what do we write in the quotient?

Divide :

<i>a</i>	<i>b</i>	<i>c</i>
9. 63,596 by 126	46,785 by 135	13 ,940 by 340
10. 78,563 by 341	78,568 by 244	81,282 by 408
11. 48,842 by 144	65,375 by 255	23,674 by 726
12. 26,786 by 354	78,634 by 184	83,765 by 415
13. 46,785 by 165	79,673 by 263	27,854 by 129
14. 83,761 by 219	86,572 by 196	76,348 by 366

1. A foot = ———
inches.

2. A yard = ———
feet.



3. What measure should you use to measure the length of your book? of your desk? the width of your schoolroom? the length of the blackboard?

4. Measure $5\frac{1}{2}$ yards or $16\frac{1}{2}$ feet along the street or on the school ground. Call it one rod.

5. With a tape measure $5\frac{1}{2}$ yards long, measure the length and the width of your school grounds in yards and feet.

6. With a pole or a tape a rod in length, measure the distance in rods and feet around a square or a field.

7. 20 city blocks, each 16 rods in length, are 320 rods long. This is called one mile. 1 mile = 320 rods.

8. There are 5280 feet in 1 mile. How many feet are there in 3 miles?

9. Memorize this table:

12 inches (in.) = 1 foot (ft.)
3 feet = 1 yard (yd.)
$5\frac{1}{2}$ yards, or $16\frac{1}{2}$ feet = 1 rod (rd.)
320 rods = 1 mile (mi.)
5280 feet = 1 mile

1. Measure a rod on the floor of the schoolroom. Pace the rod and tell approximately the number of paces to a rod.

2. Pace the width of the plot of ground on which the school is located and estimate the distance in rods.

3. By actual experience find the number of minutes required for you to walk one mile.

4. If you live near your school, determine the distance of your home from the school, either by pacing, or by finding the time required to walk that distance.

5. Estimate the length and the width of the school courts or playgrounds. Test your estimate by actual measurement.

6. Estimate the distance between your house and the house of a playmate. Test by measurement.

7. If you live in the city, count the number of blocks between your house and the school. About how far do you live from the school building?

8. Find the distance between two street lights. Estimate the number of street lights required for one mile.

9. Find the distance between two telegraph or telephone poles. How many poles that distance apart would be required for a mile?

10. Two cities are 50 miles apart. How many poles that distance apart would be required to extend telegraph wires between the two cities?

1. A sheet of paper is 15 inches in length and 8 inches in width. What is the distance around it in inches? in feet and inches over?

The distance around an oblong, or a square, is called its **perimeter**.

2. Measure the distance around the blackboard; around the teacher's desk; around the schoolroom floor.

3. Measure the perimeter of your schoolroom.

4. George wishes to build a wire netting fence around a lot 90 ft. long and 40 ft. wide. How many feet of fence are necessary?

5. The reading table in the library is 4 ft. long and 3 ft. wide. What is its perimeter in feet?

6. What is the perimeter of a field 40 rd. square? of a field 40 rd. by 30 rd.?

7. John's father owns a corner lot 125 ft. long and 25 ft. wide. What length of walk will it take for the front and the side?

- | | |
|--------------------|------------------------|
| 8. 36 in. = — ft. | 14. 640 rd. = — mi. |
| 9. 10 ft. = — in. | 15. 3 mi. = — rd. |
| 10. 12 ft. = — yd. | 16. 10,560 ft. = — mi. |
| 11. 3 yd. = — ft. | 17. 3 mi. = — ft. |
| 12. 11 yd. = — rd. | 18. 960 rd. = — mi. |
| 13. 2 rd. = — yd. | 19. 10 mi. = — rd. |

1. Draw a square inch; a square foot. What two things show that it is a *square* inch or a *square* foot?

2. Separate each side of a square foot into 12 equal parts. Connect these points by straight lines. What is the size of each square? the name of each square? How many square inches equal one square foot?

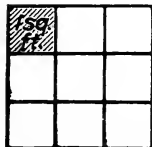
$$144 \text{ square inches (sq. in.)} = 1 \text{ square foot (sq. ft.)}$$

3. Draw on the blackboard a square yard. What two things show that it is a *square* yard?

Let 1 inch stand for 1 foot. How long, then, is the side of the square that represents a square yard?

4. Represent a square yard by a square, each side of which is $\frac{3}{4}$ inch long. Then $\frac{1}{4}$ inch represents 1 foot.

How long is each side of a square yard?



How many square feet are there in each row? in the three rows? How many square feet are there, then, in 1 square yard?

$$9 \text{ square feet} = 1 \text{ square yard (sq. yd.)}$$

5. How many square inches are there in 8 sq. ft.?
6. In 864 sq. in. how many square feet are there?
7. Find the number of square feet in 10 sq. yd.
8. Estimate the number of square yards in the floor of the schoolroom. Test by actual measurement.

1. Let 1 inch stand for 1 foot and make a drawing to show the top of the teacher's desk, which is 4 ft. wide and 6 ft. long.

2. Let 1 inch stand for 2 feet and make a diagram of the blackboard, which is 4 ft. wide and 20 ft. long.

3. The school grounds are 200 ft. wide and 300 ft. long. Make a drawing of the grounds in which 1 inch stands for 50 feet.

SUGGESTION. If 1 inch represents 50 feet, 4 inches represent 200 feet and 6 inches represent 300 feet.

4. Draw an oblong 4 in. by 4 in. and tell the number of square inches it contains.

5. A rug is 9 ft. by 12 ft. Make a drawing on a convenient scale to show this. How many square feet does it contain?

6. A schoolroom floor is 30 ft. by 40 ft. How many square feet does it contain?

7. Measure your rugs and rooms at home and make diagrams on a convenient scale to show their sizes.

8. How many square feet are there in the top of a table 2 ft. by 4 ft.?

9. How many square inches are there in a surface containing 3 sq. ft.?

10. 288 sq. in. = — sq. ft. 12. 27 sq. ft. = — sq. yd.

11. 5 sq. ft. = — sq. in. 13. 5 sq. yd. = — sq. ft.

1. Write the days of the week and the months of the year, with their abbreviations.

2. Observe that the **second hand** moves over 60 small or second spaces, while the minute hand moves over one minute space.



3. Memorize this table :

60 seconds (sec.)	= 1 minute (min.)
60 minutes	= 1 hour (hr.)
24 hours	= 1 day (da.)
365 days	= 1 year (yr.)

September, November, April, and June have 30 days each. All the other months except February have 31 days each. February usually has 28 days. A year that has 366 days is called a **leap year**. In leap year February has 29 days.

4. Memorize this rime :

Thirty days have September,
April, June, and November.
All the rest have thirty-one,
Save February, which alone
Has twenty-eight; and one day more
We add to it one year in four.

Change :

5. 3 min. to sec.
6. 6 da. to hours.
7. 7 hr. to minutes.
8. 3 da. 6 hr. to hr.
9. 10 wk. 6 da. to da.

10. How many days are there in April, May, and June? in November, December, and January?

1. Name the months in the year that have 28 days; 29 days; 30 days; and 31 days.

2. John has 15 minutes of recess in the morning, 15 minutes in the afternoon, and 1 hour at noon. How many minutes of recess has he in all?

3. Mary studies 40 minutes each evening for 6 nights a week. How many minutes does she study during the week? how many hours?

4. Alfred works 30 minutes each day in his school garden. How many minutes does he work in 6 days? how many hours?

5. Add in minutes $\frac{1}{4}$ hr. and $\frac{1}{2}$ hr.

6. Susan helps her mother 15 minutes in the morning and 20 minutes in the evening. How many minutes does she help each day?

7. Clyde averages 30 minutes in home study for 180 school days. How many hours of home study does he average?

8. A hammer makes 2 strokes each second. How many strokes does it make in a minute?

9. William gets a book from the library which is to be returned June 16. The book is returned June 30 with a charge of 2¢ a day for overtime. How much does William pay?

10. Maud retires at 8.40 P.M. and rises at 6.40 A.M. How many hours is she in bed?

1. Name some articles bought by the ounce; by the pound.

2. How many ounces are there in 1 pound? in 10 pounds?



Coal, hay, sand, plaster, etc., in large quantities, are sold by the ton of 2000 pounds.

3. Memorize this table:

16 ounces (oz.) = 1 pound (lb.)
2000 pounds = 1 ton (T.)

4. How many pounds of coal are there in 8 tons? in 7 tons? in 12 tons?

5. Find the number of tons and pounds in 7460 lb. of ice.

6. A freight car carries 60,000 pounds of freight. How many tons does it carry?

7. A dealer buys 150 bales of hay, averaging 90 pounds to the bale. How many tons and pounds over does he buy?

8. 32 oz. = — lb.

12. 4000 lb. = — T.

9. 64 oz. = — lb.

13. 8000 lb. = — T.

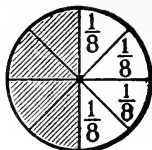
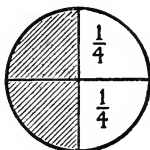
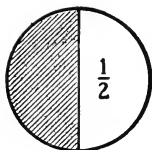
10. 5 lb. = — oz.

14. 5 T. = — lb.

11. 4 lb. = — oz.

15. 10 T. = — lb.

1. At 3 cents an ounce, how much does 1 pound of mustard cost?
2. 2 tons of rolled oats were packed in pound packages. How many packages were there?
3. A load of hay weighed 4000 pounds. How many tons did it weigh?
4. Find the weight of 20 kegs of nails, each weighing 100 lb.
5. A man delivered 3 tons of coal in bags containing 100 lb. each. How many bags of coal were there?
6. How much do 16 lb. prunes cost at 12¢ a pound?
7. How many ounces of butter are there in 24 lb.?
8. How much do 18 lb. butter cost at 48¢ a pound?
9. John's father got a coal bill for 6500 lb. of soft coal. How many even tons and pounds over had he bought?
10. How many pounds are there in 3 tons? in 5 tons? in 8 tons?
11. William sold 340 eight-pound baskets of grapes. How many tons and pounds over did they make?
12. How many 2-ounce packages of ginger could be sold from 10 lb. 10 oz. of ginger?
13. John weighed 101 lb. 9 oz.; and James 111 lb. 10 oz. How many ounces more did James weigh than John?



1. $\frac{1}{2} = \frac{?}{4} = \frac{?}{8}$

6. $\frac{2}{8} + \frac{2}{8} = \frac{?}{8}$

2. $\frac{1}{2} + \frac{1}{2} = \frac{?}{2}$

7. $\frac{4}{4} = \frac{?}{8}$

3. $\frac{1}{4} + \frac{2}{4} = \frac{?}{4}$

8. $\frac{2}{2} = \frac{?}{8}$

4. $\frac{1}{4} + \frac{1}{2} = \frac{?}{4}$

9. $\frac{4}{8} = \frac{?}{4}$

5. $\frac{2}{4} = \frac{?}{8}$

10. $\frac{6}{8} = \frac{?}{4}$

Draw two lines of equal length. Divide one into fourths and the other into eighths. Refer to them in answering the following:

11. Which is greater, $\frac{2}{4}$ or $\frac{3}{8}$? How much greater is it?

12. How much greater is $\frac{1}{4}$ than $\frac{1}{8}$?

13. Compare $\frac{3}{4}$ with $\frac{3}{8}$; $\frac{1}{2}$ with $\frac{1}{4}$.

14. From $\frac{4}{8}$ subtract $\frac{1}{4}$.

15. Compare $\frac{6}{8}$ with $\frac{3}{4}$.

16. How much is 3 times $\frac{1}{4}$?

17. How many times must $\frac{1}{8}$ be taken to make $\frac{1}{2}$? to make $\frac{1}{4}$?

18. If you cut $\frac{1}{2}$ of a yard from $\frac{3}{4}$ of a yard of ribbon, how much ribbon will be left?

- | | |
|----------------------------------|---|
| 1. $\frac{1}{2}$ qt. = ——— pt. | 11. $\frac{1}{2}$ min. = ——— sec. |
| 2. $\frac{1}{4}$ gal. = ——— qt. | 12. $\frac{1}{4}$ da. = ——— hr. |
| 3. $\frac{1}{8}$ pk. = ——— qt. | 13. $\frac{1}{4}$ pk. = ——— qt. |
| 4. $\frac{1}{2}$ lb. = ——— oz. | 14. $\frac{1}{4}$ lb. = ——— oz. |
| 5. $\frac{1}{2}$ hr. = ——— min. | 15. $\frac{1}{8}$ lb. = ——— oz. |
| 6. $\frac{1}{4}$ hr. = ——— min. | 16. $\frac{1}{2}$ mi. = ——— ft. |
| 7. $\frac{1}{8}$ da. = ——— hr. | 17. $\frac{1}{2}$ mi. = ——— rd. |
| 8. $\frac{1}{2}$ doz. = ——— | 18. $\frac{1}{2}$ sq. ft. = ——— sq. in. |
| 9. $\frac{1}{4}$ doz. = ——— | 19. $\frac{1}{4}$ mi. = ——— ft. |
| 10. $\frac{1}{2}$ gal. = ——— qt. | 20. $\frac{1}{8}$ mi. = ——— ft. |

21. If each of three children receives $\frac{1}{4}$ of a pound of candy, how much do they all receive?

22. If I study my lessons $\frac{3}{4}$ hr., how many minutes do I study?

23. Ruth has $\frac{5}{8}$ of a yard of silk. She cuts off $\frac{1}{2}$ yard for a doll's dress. How much is left?

24. How much lace is there in 2 remnants, one of which measures $\frac{1}{2}$ yd. and the other $\frac{1}{4}$ yd.?

25. Find the cost of $\frac{1}{2}$ qt. of milk at 14¢ a quart.

26. How much must I pay for $\frac{1}{4}$ doz. buttons at 12¢ a dozen?

27. At 80¢ a pound find the cost of $\frac{1}{4}$ lb. of tea.

The Junior Red Cross



1. How much is the Red Cross School Fund in a school that enrolls 240 members in the Junior Red Cross, and collects \$1 from each 4 members?

2. In a town where the school attendance was 2340, $\frac{1}{3}$ of the pupils joined the Junior Red Cross. How many members were there?

3. In one large city the school children made 17,122 refugee and hospital garments, 347 sweaters, 42 scarfs, 210 wristlets, 216 socks, 29 helmets, 25 caps, and 350 wash cloths. Find the total number of articles made by these children.

4. Some of the children made cotton pads of gauze 18 inches by 12 inches. How many square inches of gauze were there in each pad?

5. In one school the children made 296 comfort kits at a cost of \$2 each. Find the total cost.

6. Two schools gave entertainments for their Red Cross Fund. One earned \$283.52, and the other \$194.78. How much more did the first earn than the second?

7. In the state of New York, 241,980 children representing 545 schools were enrolled in the Junior Red Cross. What was the average enrollment for each school?

Multiply five of these examples in one minute :

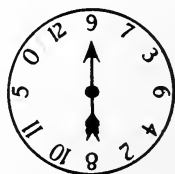
By 9	By 7	By 8	By 6
1. 2467	6. 6935	11. 6238	16. 6294
2. 3258	7. 9186	12. 1459	17. 7386
3. 9614	8. 2734	13. 9345	18. 9281
4. 2836	9. 8567	14. 2764	19. 4936
5. 9205	10. 2137	15. 3285	20. 9275

Divide four of these examples in one minute :

By 8	By 9	By 7	By 6
21. 8143	25. 8769	29. 8637	33. 8425
22. 2695	26. 2893	30. 2049	34. 6439
23. 7378	27. 6241	31. 9267	35. 9375
24. 6291	28. 7083	32. 7328	36. 8162

Spinning the Arrow

Make a circle of cardboard. Place numbers from 0 to 12, omitting 1, at regular intervals around the circumference. Fasten an arrow loosely in the center. Each child spins the arrow, multiplies the number to which the arrow points by a given number, and adds the number opposite the arrow. For example, one child spins, multiplies the indicated number (say 9) by 6, and adds 8 ; another child spins, multiplies 12 by 8, and adds 2.



Find how long it takes you to get the *right answers* to each set of five examples.

I

1. $462 \times 306 = ?$
2. Write in words
387,642.
3. $\$126 - \$.87 = ?$
4. $8370 \div 77 = ?$
5. Find $\frac{1}{8}$ of 6472.

II

1. $\$800 - \$786.47 = ?$
2. Divide 2543 by 74.
3. Which is greater, $\frac{3}{4}$
or $\frac{7}{8}$?
4. $782 \times 700 = ?$
5. $9450 \div 86 = ?$

III

1. Write in figures one
hundred thousand.
2. Subtract 3847 from
9600.
3. $66,800 \div 71 = ?$
4. Show $\frac{4}{5}$ of a line.
5. $876 \times 290 = ?$

IV

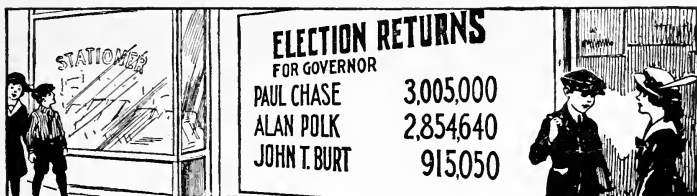
1. How much greater is
3645 than 2709?
2. $647 \times 316 = ?$
3. $33,075 \div 82 = ?$
4. Find $\frac{1}{9}$ of 1089.
5. Write in figures seven
thousand six.

V

1. $\$364 - \$297.68 = ?$
2. $74,937 \div 807 = ?$
3. $120 \times \$6384 = ?$
4. Write in words
600,710.
5. Find $\frac{1}{8}$ of 816.

VI

1. Write in figures nine
thousand nine.
2. $964 - 789 = ?$
3. $42,164 \div 221 = ?$
4. $\frac{1}{2} - \frac{1}{4} = ?$
5. $207 \times \$300 = ?$



CHAPTER VI

READING AND WRITING NUMBERS

1. What is the largest number that can be written with six figures?

One thousand thousand is called **one million** and is written 1,000,000. 20 million is written 20,000,000. 500 million is written 500,000,000.

MILLIONS' PERIOD			THOUSANDS' PERIOD			UNITS' PERIOD		
Hundred- millions	Ten- millions	Millions	Hundred- thousands	Ten- thousands	Thousands	Hundreds	Tens	Ones
1	0	2,	0	5	6,	4	0	5

This number is read *102 million, 56 thousand, 405*.

2. Read the numbers in the picture.

Read and then write from dictation :

- | | | | |
|------------|-----------|------------|-------------|
| 3. 49,608 | 5,077,470 | 35,378,429 | 391,370,605 |
| 4. 999,999 | 6,960,000 | 69,091,404 | 225,400,204 |

Read ; then write from dictation :

	<i>a</i>	<i>b</i>	<i>c</i>
1.	\$647.84	\$100,000.00	\$3,648.98
2.	\$2,967.20	\$25,647.29	\$2,280.47
3.	\$3,004.05	\$19,614.18	\$35,470.90
4.	\$23,764.00	\$237,412.10	\$3,645.32

Read the following large numbers :

5.	2,346,521	40,056,019	225,643,142
6.	5,005,203	75,503,002	421,095,010
7.	4,500,600	94,000,501	950,500,000
8.	7,095,008	83,050,000	600,000,578

Write in figures :

9. Three million fifty thousand two hundred.
10. Sixty million one thousand eighty-nine.
11. Nine hundred million five thousand four.
12. Read: We provided 19,550,000 tons of food in 1919, to feed 200,000,000 people abroad.
13. Write the first twelve Roman numbers.
14. Learn the following Roman numbers :

XIII	XIV	XV	XVI	XVII	XVIII	XIX	XX
13	14	15	16	17	18	19	20
XXX	XL	L	LX	LXX	LXXX	XC	C
30	40	50	60	70	80	90	100

15. Write the Roman numbers for :

18	19	34	46	57	65	79	82	93	100
----	----	----	----	----	----	----	----	----	-----

16. Read :

XXXIX	XLI	LXII	LXXXI	XCI	LXXIV
-------	-----	------	-------	-----	-------

Add, writing the answers on a piece of paper placed beneath the examples. Try to find the sums of four examples in $1\frac{1}{2}$ minutes:

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
1.	\$751.04	\$146.80	\$345.75	\$4187.90
	690.20	12.96	187.60	64.72
	404.72	842.90	962.45	124.87
	812.42	950.45	878.72	2671.82
	900.25	2.75	964.54	48.96
	<u>10.48</u>	<u>24.87</u>	<u>12.68</u>	<u>702.84</u>
2.	\$964.77	\$420.41	\$862.41	\$3864.12
	844.76	703.45	742.87	246.98
	99.75	802.60	368.23	107.64
	184.65	12.87	467.28	963.66
	209.87	908.72	643.82	5478.23
	84.72	885.88	782.95	682.87
	104.88	225.12	328.15	478.24
	<u>84.91</u>	<u>380.96</u>	<u>841.62</u>	<u>332.85</u>
3.	\$844.62	\$642.83	\$321.62	\$2891.42
	256.48	469.27	41.68	117.68
	741.87	184.64	769.62	49.64
	369.73	926.48	186.47	961.41
	108.42	12.93	524.93	87.83
	957.68	193.67	834.71	113.22
	87.64	446.72	221.34	6487.64
	<u>123.96</u>	<u>689.38</u>	<u>455.26</u>	<u>923.06</u>

Copy, subtract, and test four examples in $2\frac{1}{2}$ minutes :

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
1.	\$ 843.87 <u>632.17</u>	\$ 376.47 <u>248.02</u>	\$ 2498.73 <u>519.71</u>	\$ 48,892.00 <u>15,079.63</u>
2.	\$ 600.01 <u>289.81</u>	\$ 246.91 <u>19.17</u>	\$ 7739.82 <u>7015.09</u>	\$ 32,171.19 <u>16,593.40</u>
3.	\$ 940.09 <u>16.41</u>	\$ 897.63 <u>600.75</u>	\$ 9999.86 <u>1305.17</u>	\$ 45,269.79 <u>27,319.27</u>
4.	\$ 632.25 <u>245.19</u>	\$ 741.20 <u>523.18</u>	\$ 5020.37 <u>2456.78</u>	\$ 37,461.27 <u>19,842.07</u>
5.	\$ 395.33 <u>49.27</u>	\$ 461.05 <u>37.97</u>	\$ 3649.08 <u>500.16</u>	\$ 27,004.49 <u>19,017.63</u>
6.	\$ 582.36 <u>19.36</u>	\$ 679.87 <u>27.93</u>	\$ 4532.98 <u>403.61</u>	\$ 75,009.75 <u>69,135.92</u>
7.	\$ 780.16 <u>25.31</u>	\$ 665.32 <u>413.27</u>	\$ 8763.55 <u>6300.01</u>	\$ 97,382.99 <u>39,853.75</u>
8.	\$ 867.35 <u>759.32</u>	\$ 751.27 <u>427.75</u>	\$ 5983.27 <u>2742.19</u>	\$ 32,148.91 <u>14,269.90</u>
9.	\$ 990.00 <u>537.17</u>	\$ 886.95 <u>214.75</u>	\$ 9836.92 <u>4775.48</u>	\$ 33,197.84 <u>19,057.55</u>

1. Multiply \$1.25 by 3.

$$\begin{array}{r} \$1.25 \\ 3 \\ \hline \$3.75 = 375\text{¢} \end{array}$$

In multiplying dollars and cents, place the decimal point in the product *directly under* the decimal point in the multiplicand. Write

the dollar sign before the number of dollars.

2. Multiply 70¢ by 3.

$$\begin{array}{r} 70\text{¢} \\ 3 \\ \hline 210\text{¢} = \$2.10 \end{array}$$

3. Multiply \$.75 by 4.

$$\begin{array}{r} \$.75 \\ 4 \\ \hline \$3.00 = 300\text{¢} \end{array}$$

Multiply :

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>
4.	\$3.50	\$3.05	\$6.05	\$9.40	\$7.04
	<u>2</u>	<u>4</u>	<u>3</u>	<u>5</u>	<u>4</u>

5.	\$.60	\$.08	74¢	49¢	95¢
	<u>5</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>5</u>

6. How much do 3 baskets of peaches cost at \$.65 a basket?

7. A messenger boy delivers 4 messages at \$.45 each. How much does he earn for his company?

8. If Mary earns \$9.75 a week in a department store, find her wages for 4 weeks.

9. At \$1.50 apiece, find the cost of 6 tickets for a concert.

10. Find the cost of 6 railroad tickets at \$4.68 each.

Household Purchases

Eggs, \$.48 a dozen	Cheese, \$.28 a pound
Nut butter, \$.32 a pound	Coffee, \$.28 a pound
Apples, \$4.65 a barrel	Tomatoes, \$.75 a crate
Flour, \$10 a barrel	Oranges, \$.45 a dozen

At the above price how much must I pay for each of the following purchases?

1. 8 dozen eggs.
2. 7 pounds of cheese.
3. 4 barrels of apples.
4. 12 pounds of coffee.
5. 6 crates of tomatoes.
6. 2 barrels of flour.
7. 9 pounds of butter.
8. 16 pounds of butter.
9. 4 dozen eggs and 2 pounds of butter.
10. 1 barrel of flour and 3 crates of tomatoes.
11. 2 dozen oranges and 2 dozen eggs.

The following represent the daily purchases of certain provisions by hotels. Find how much is paid in 7 days; in 10 days; in 24 days; in 236 days.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
12.	\$4.27	\$6.18	\$7.00	\$5.35
13.	\$9.65	\$37.25	\$.87	\$6.75
14.	\$.48	\$3.84	\$6.95	\$4.44
15.	\$.50	\$9.50	\$4.89	\$9.99

16. Find the cost of 2 dozen chairs at \$2.75 each.
17. It requires 40 yards of carpet for a certain room. How much will it cost at \$2.98 a yard?

In the Trolley Car

1. How many seats are there on each side of the car?

2. When 8 seats were vacant on each side, how many were occupied?

3. The conductor collected 75 fares on the first trip and 87 fares on the return trip. How many fares did he collect?

4. The fare was 5 cents. How much money did he collect on both trips?

5. A lady paid for herself and 5 children. She gave the conductor a half dollar. How much change should she receive?

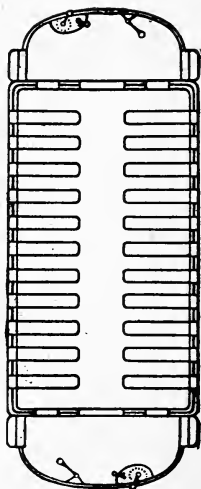
6. Each seat accommodated two persons. How many persons could be seated in the car?

7. The conductor earned \$3.80 in a day. How much did he earn in 5 days?

8. The motorman earned \$4.25 a day. How much did he earn in 5 days? How much more did he earn in a day than the conductor?

9. The line was 8 miles long. How far did a car run in making 5 round trips?

10. On one trip each seat was occupied, and 5 persons had to stand. Find the amount of the fares for the trip.



Numbers that name objects are **concrete**; as, 6 apples, 3 boys, 5 yards.

Numbers that do not name objects are **abstract**; as, 7, 9, 3.

1. Which of the following numbers are abstract? Which are concrete? 8; 6 eggs; \$4; 5¢; 25; 4 feet.

2. Name the multiplier and the multiplicand:

\$8	64 days	81 horses	72 oranges
<u>5</u>	<u>4</u>	<u>7</u>	<u>3</u>

The product has the *same* name as the multiplicand.
The multiplier is always an abstract number.

When two numbers are multiplied, the *number in the product* remains the same in whatever order the numbers are taken; thus, $7 \times 12 = 12 \times 7$.

3. How much do I earn in 125 days at \$3 a day?

When the multiplier has more figures than the multiplicand, the product may be found as at the left, but the explanation should be given thus:

$$\begin{array}{r} 125 \\ 3 \\ \hline 375 \end{array}$$

In one day I earn \$3.

In 125 days, I earn $125 \times \$3$, or \$375.

Find the cost of:

How many:

4. 319 days' work at \$3.

7. Pints in 327 qt.?

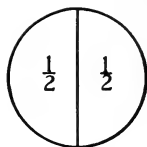
5. 817 tons coal at \$9.

8. Inches in 845 ft.?

6. 198 lb. meal at 9¢.

9. Pecks in 164 bu.?

1. Into how many parts has this circle been divided? What is the name of each part? Into how many halves can any object be divided?



2. 1 half apple + 1 half apple = ? $\$ \frac{1}{2} + \$ \frac{1}{2} = ?$

Find the sum of:

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
3. $1\frac{1}{2}$ gal.	$4\frac{1}{2}$ bu.	$5\frac{1}{2}$ yd.	$3\frac{1}{2}$ qt.
— 3 gal.	<u>$2\frac{1}{2}$ bu.</u>	<u>$4\frac{1}{2}$ yd.</u>	<u>$\frac{1}{2}$ qt.</u>

4. Add:

$15\frac{1}{2}$ $\frac{1}{2} + \frac{1}{2} = 1$; $1 + \frac{1}{2} = 1\frac{1}{2}$.

$9\frac{1}{2}$ Write the fraction $\frac{1}{2}$, and add 1 to the whole numbers.

$6\frac{1}{2}$ 5. $4\frac{1}{2} + 27\frac{1}{2} + 3\frac{1}{2}$ 7. $11\frac{1}{2} + 25\frac{1}{2} + 42\frac{1}{2}$

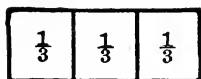
$31\frac{1}{2}$ 6. $9\frac{1}{2} + 18\frac{1}{2} + 27\frac{1}{2}$ 8. $9 + 37\frac{1}{2} + 86\frac{1}{2}$

Insert the missing number. The number below the line is the sum.

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>
9. $4\frac{1}{2}$	$7\frac{1}{2}$	$6\frac{1}{2}$	$8\frac{1}{2}$	$9\frac{1}{2}$	11
?	?	?	?	?	?
<u>$10\frac{1}{2}$</u>	<u>$15\frac{1}{2}$</u>	<u>$7\frac{1}{2}$</u>	<u>$12\frac{1}{2}$</u>	<u>$18\frac{1}{2}$</u>	<u>$20\frac{1}{2}$</u>

Subtract:

10. $8\frac{1}{2}$	$4\frac{1}{2}$	$12\frac{1}{2}$	$11\frac{1}{2}$	$14\frac{1}{2}$	$62\frac{1}{2}$
<u>5</u>	<u>3</u>	<u>$10\frac{1}{2}$</u>	<u>$9\frac{1}{2}$</u>	<u>$7\frac{1}{2}$</u>	<u>37</u>



1. How many thirds are there in this oblong? How many thirds are there in one of anything? How many feet are there in 1 yard? What part of a yard is 1 foot? What part of a yard is 12 inches? How many thirds are there in 2 oranges?

Add:

2. $\frac{1}{3} + \frac{1}{3} = \frac{2}{3}$ $\frac{1}{3} + \frac{1}{3} + \frac{1}{3} = \frac{3}{3}$, or 1 $\frac{2}{3} + \frac{2}{3} + \frac{2}{3} = \frac{6}{3}$, or 2

a	b	c	d	e
3. $4\frac{1}{3}$	$6\frac{2}{3}$	$5\frac{1}{3}$	$8\frac{1}{3}$	$9\frac{1}{3}$
$\underline{2\frac{2}{3}}$	$\underline{1\frac{1}{3}}$	$\underline{4}$	$\underline{5\frac{1}{3}}$	$\underline{7\frac{2}{3}}$

4. $8\frac{1}{3}$	$7\frac{2}{3}$	$9\frac{1}{3}$	7	12
$\underline{10\frac{1}{3}}$	$\underline{6\frac{2}{3}}$	$\underline{5}$	$\underline{8\frac{2}{3}}$	$\underline{8\frac{1}{3}}$

Find the missing number. The number below the line is the sum.

5. $8\frac{2}{3}$	$9\frac{1}{3}$	7	$15\frac{1}{3}$	$8\frac{2}{3}$
$\frac{?}{?}$	$\frac{?}{?}$	$\frac{?}{?}$	$\frac{?}{?}$	$\frac{?}{?}$
$\underline{11\frac{2}{3}}$	$\underline{14\frac{2}{3}}$	$\underline{12\frac{2}{3}}$	$\underline{18\frac{2}{3}}$	$\underline{11\frac{2}{3}}$

Subtract:

6. $7\frac{2}{3}$	$8\frac{2}{3}$	$9\frac{2}{3}$	$18\frac{2}{3}$	$17\frac{2}{3}$
$\underline{3}$	$\underline{5\frac{1}{3}}$	$\underline{4\frac{2}{3}}$	$\underline{5\frac{2}{3}}$	$\underline{9\frac{2}{3}}$

7. I rubbed out $2\frac{2}{3}$ inches from a line $5\frac{2}{3}$ inches long. How long was the part remaining?

1. Into how many parts has the square been divided? Give the name of each part. What is the difference between a quarter of \$1 and a fourth of \$1? Into how many fourths can any object be divided?

$\frac{1}{4}$	$\frac{1}{4}$
$\frac{1}{4}$	$\frac{1}{4}$

$$\frac{1}{4} + \frac{1}{4} + \frac{1}{4} = \text{how many fourths?} \quad \frac{3}{4} \text{ gal.} + \frac{1}{4} \text{ gal.} = ?$$

Find the sums:

2. $\$2\frac{1}{4} + \$\frac{3}{4}$ 4. $6\frac{1}{4} \text{ gal.} + \frac{3}{4} \text{ gal.}$ 6. $8\frac{1}{4} \text{ bu.} + \frac{3}{4} \text{ bu.}$
 3. $6\frac{1}{4} + \frac{1}{4}$ 5. $3\frac{1}{4} \text{ pk.} + 2\frac{2}{4} \text{ pk.}$ 7. $7\frac{3}{4} \text{ hr.} + 1\frac{1}{4} \text{ hr.}$

Add:

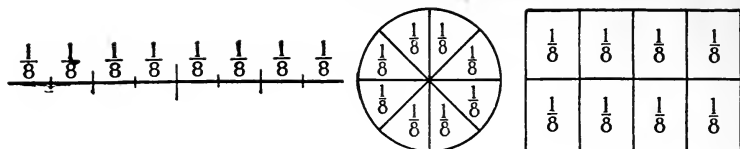
	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>
8.	$2\frac{1}{4}$	$6\frac{2}{4}$	$5\frac{1}{4}$	$3\frac{1}{4}$	$10\frac{2}{4}$	$12\frac{1}{4}$
	$3\frac{2}{4}$	$7\frac{3}{4}$	$6\frac{1}{4}$	$8\frac{1}{4}$	$7\frac{3}{4}$	9
	$5\frac{1}{4}$	$8\frac{3}{4}$	$25\frac{1}{4}$	$9\frac{1}{4}$	$8\frac{3}{4}$	$8\frac{3}{4}$
9.	11	$18\frac{3}{4}$	$19\frac{1}{4}$	$\frac{3}{4}$	$5\frac{1}{4}$	$20\frac{1}{4}$
	$14\frac{1}{4}$	$16\frac{2}{4}$	8	$\frac{3}{4}$	$6\frac{3}{4}$	8
	$27\frac{1}{4}$	$21\frac{3}{4}$	$62\frac{3}{4}$	$\frac{2}{4}$	17	$31\frac{3}{4}$

Complete:

10. $4\frac{1}{4} + ? = 9\frac{3}{4}$ 12. $6\frac{1}{4} + ? = 11\frac{1}{4}$ 14. $? + 8\frac{1}{4} = 15\frac{1}{4}$
 11. $6\frac{3}{4} + ? = 8\frac{3}{4}$ 13. $9\frac{3}{4} + ? = 13\frac{3}{4}$ 15. $? + \frac{1}{4} = 6\frac{2}{4}$

Find the differences:

16. $8\frac{1}{4} - 7$ 19. $9\frac{3}{4} - 8\frac{1}{4}$ 22. $19\frac{3}{4} - 7\frac{1}{4}$
 17. $16\frac{3}{4} - 5\frac{1}{4}$ 20. $16\frac{1}{4} - 7\frac{1}{4}$ 23. $16\frac{1}{4} - 8$
 18. $23\frac{3}{4} - 7\frac{3}{4}$ 21. $12\frac{2}{4} - 11\frac{2}{4}$ 24. $14\frac{1}{4} - 7$



1. Into how many eighths can any whole unit be divided?

2. Compare $\frac{1}{2}$ of a unit and $\frac{4}{8}$ of a unit.

3. Compare $\frac{2}{4}$ of a unit and $\frac{4}{8}$ of a unit.

4. $\frac{2}{8} + \frac{1}{8} = \frac{?}{8}$.

5. $\frac{1}{8}$ is what part of $\frac{1}{4}$?

6. $\frac{6}{8} - \frac{3}{8} = \frac{?}{8}$.

Add:

7.
$$\begin{array}{r} 3\frac{1}{8} \\ 3\frac{1}{8} \\ \hline 4\frac{1}{8} \end{array}$$

8.
$$\begin{array}{r} 7\frac{3}{8} \\ 8\frac{1}{8} \\ \hline 9\frac{1}{8} \end{array}$$

9.
$$\begin{array}{r} 6\frac{1}{8} \\ 7\frac{1}{8} \\ \hline 9\frac{2}{8} \end{array}$$

10.
$$\begin{array}{r} 9\frac{1}{8} \\ 11 \\ \hline 6\frac{1}{8} \end{array}$$

11.
$$\begin{array}{r} 5\frac{3}{8} \\ 12\frac{1}{8} \\ \hline 3\frac{1}{8} \end{array}$$

12. $\frac{3}{4} + \frac{2}{4} + \frac{3}{4} = \frac{8}{4}$, or 2 whole units; $\frac{3}{8} + \frac{7}{8} + \frac{6}{8} =$ how many whole units?

Subtract; then add:

13.
$$\begin{array}{r} 10\frac{3}{8} \\ 5\frac{2}{8} \\ \hline \end{array}$$

4.
$$\begin{array}{r} 12\frac{3}{8} \\ 6\frac{1}{8} \\ \hline \end{array}$$

15.
$$\begin{array}{r} 27\frac{4}{8} \\ 8\frac{3}{8} \\ \hline \end{array}$$

16.
$$\begin{array}{r} 19\frac{2}{8} \\ 6\frac{1}{8} \\ \hline \end{array}$$

17.
$$\begin{array}{r} 36\frac{4}{8} \\ 16\frac{3}{8} \\ \hline \end{array}$$

18.
$$\begin{array}{r} 62\frac{5}{8} \\ 31\frac{1}{8} \\ \hline \end{array}$$

19.
$$\begin{array}{r} 63\frac{3}{8} \\ 39\frac{1}{8} \\ \hline \end{array}$$

20.
$$\begin{array}{r} 26\frac{4}{8} \\ 24\frac{3}{8} \\ \hline \end{array}$$

21.
$$\begin{array}{r} 18\frac{3}{8} \\ 9\frac{3}{8} \\ \hline \end{array}$$

22.
$$\begin{array}{r} 40\frac{3}{8} \\ 20\frac{1}{8} \\ \hline \end{array}$$

1. Mary made a dress for herself, using $5\frac{1}{2}$ yards of cloth for the skirt and $2\frac{1}{2}$ yards for the waist. How many yards did she use for both?

2. Martha made $8\frac{1}{2}$ gallons of lemonade for a fair and sold 7 gallons. How much was unsold?

3. A dealer sold $2\frac{1}{4}$ tons of coal at one time and $3\frac{3}{4}$ tons at another time. How many tons did he sell?

4. From a barrel containing $31\frac{1}{2}$ gallons, 25 gallons were sold. How many gallons remained?

5. A dairyman sold in one month $1875\frac{1}{2}$ gallons of milk. He sold 250 gallons less the next month. How much did he sell the second month?

6. A farmer dug potatoes as follows: 23 bu., $24\frac{1}{2}$ bu., and $11\frac{1}{2}$ bu. How many bushels did he dig?

7. After he had sold $56\frac{1}{2}$ bu. of the potatoes, how many bushels had he left?

8. A stick $18\frac{2}{3}$ in. long was cut into two parts. One part was $7\frac{2}{3}$ in. long. How long was the other part?

9. Arthur's father owned $30\frac{1}{2}$ acres of land. He sold all but $24\frac{1}{2}$ acres at \$48 an acre. How much did he receive for the part sold?

10. Find the weight of 4 cakes of ice containing $35\frac{1}{2}$ lb., 18 lb., $22\frac{1}{2}$ lb., and 16 lb.

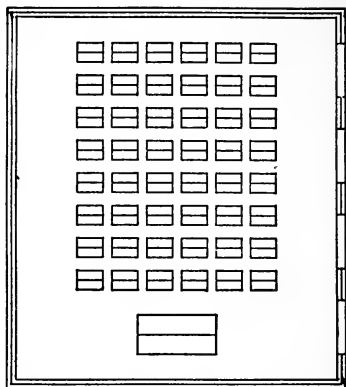
11. Find the distance around a room that is $18\frac{1}{8}$ ft. long and 16 ft. wide.

In the Schoolroom

1. This schoolroom is 28 feet wide and 32 feet long. What is the distance around it?

2. The glass in each window cost \$2.50. How much was paid for all the glass?

3. Each desk cost \$3.25. Find the cost of the desks in each long row.



4. Find the value of the desks in the 6 rows.

5. The attendance for the first 8 school days was as follows: 36, 43, 42, 43, 37, 41, 43, 43. What was the average attendance?

NOTE. To find the average add the eight numbers and divide the sum by 8.

6. Eight tons of coal were used during the term. How much was paid for the coal at \$8.50 a ton?

7. What was the amount of the teacher's salary for 8 months, at \$70 a month?

8. Find the entire cost of:

48 Advanced Geographies at \$1.00 each.

48 Primary Geographies at \$.45 each.

48 Grammars at \$.50 each.

48 Language Lessons at \$.35 each.

48 Readers at \$.48 each.

1. Find $\frac{2}{3}$ of 24.

$$\frac{1}{3} \text{ of } 24 = 8;$$

$$\frac{2}{3} \text{ of } 24 = 2 \times 8, \text{ or } 16.$$

How do we find $\frac{1}{3}$ of a number? $\frac{2}{3}$ of a number $= 2 \times \frac{1}{3}$ of the number.

Give rapidly :

2. $\frac{1}{2}$ of each number : 16, 24, 36, 44, 48, 50.

3. $\frac{1}{3}$ and $\frac{2}{3}$ of each number : 15, 18, 21, 36, 45.

4. $\frac{1}{4}$ and $\frac{3}{4}$ of each number : 16, 20, 28, 32, 48.

5. $\frac{1}{5}$, $\frac{2}{5}$, $\frac{3}{5}$, and $\frac{4}{5}$ of each number : 20, 35, 45, 40, 80.

Find :

- | | | | |
|-------------------------|-------------------------|-------------------------|--------------------------|
| 6. $\frac{1}{3}$ of 27 | 12. $\frac{2}{3}$ of 27 | 18. $\frac{2}{3}$ of 33 | 24. $\frac{2}{3}$ of 75 |
| 7. $\frac{1}{3}$ of 24 | 13. $\frac{3}{4}$ of 36 | 19. $\frac{3}{4}$ of 40 | 25. $\frac{2}{5}$ of 75 |
| 8. $\frac{1}{2}$ of 26 | 14. $\frac{1}{7}$ of 56 | 20. $\frac{2}{5}$ of 60 | 26. $\frac{3}{4}$ of 96 |
| 9. $\frac{1}{2}$ of 42 | 15. $\frac{1}{8}$ of 64 | 21. $\frac{7}{8}$ of 24 | 27. $\frac{1}{2}$ of 144 |
| 10. $\frac{2}{3}$ of 51 | 16. $\frac{1}{9}$ of 63 | 22. $\frac{2}{5}$ of 65 | 28. $\frac{3}{5}$ of 160 |
| 11. $\frac{3}{5}$ of 25 | 17. $\frac{2}{3}$ of 63 | 23. $\frac{5}{6}$ of 48 | 29. $\frac{4}{5}$ of 255 |

Find :

- | | | |
|---------------------------|------------------------------|------------------------------|
| 30. $\frac{2}{3}$ of \$39 | 36. $\frac{3}{4}$ of 12 lb. | 42. $\frac{1}{2}$ of \$8.20 |
| 31. $\frac{3}{4}$ of \$24 | 37. $\frac{2}{3}$ of 9 ft. | 43. $\frac{1}{3}$ of \$12.60 |
| 32. $\frac{1}{2}$ of \$56 | 38. $\frac{1}{3}$ of 12 yd. | 44. $\frac{1}{4}$ of \$20.40 |
| 33. $\frac{2}{3}$ of \$42 | 39. $\frac{3}{4}$ of 52 gal. | 45. $\frac{1}{3}$ of \$15.90 |
| 34. $\frac{3}{4}$ of \$44 | 40. $\frac{3}{4}$ of 8 bu. | 46. $\frac{1}{4}$ of \$24.20 |
| 35. $\frac{5}{6}$ of \$60 | 41. $\frac{7}{8}$ of 80 mi. | 47. $\frac{3}{10}$ of \$100 |

The sign @ followed by a price means "at" so much a unit. Thus, "3 lb. steak @ \$.40" means "3 lb. steak at \$.40 a pound;" "6 doz. buttons @ \$.20" means "6 doz. buttons at \$.20 a dozen."

Find the cost of:

1. 3 lb. lard @ \$.32.
2. 6 doz. eggs @ \$.48.
3. 5 sheep @ \$4.75.
4. 6 bureaus @ \$7.75.
5. 6 cows @ \$80.
6. 6 rugs @ \$4.75.
7. 6 lb. cornmeal @ \$.04.
8. 5 cans tomatoes @ \$.12.
9. 6 hats @ \$1.25.
10. 5 books @ \$1.75.
11. 6 lamps @ \$1.33.
12. 6 wagons @ \$85.
13. Multiply 16 by $2\frac{1}{2}$.

SHORT FORM

$$\begin{array}{rcl}
 & 16 & \\
 & 2\frac{1}{2} & \\
 \frac{1}{2} \text{ of } 16 = & \frac{8}{2} & 2\frac{1}{2} \text{ times } 16 \text{ means that} \\
 2 \times 16 = & 32 & \frac{1}{2} \text{ of } 16 \text{ is to be added to} \\
 2\frac{1}{2} \times 16 = & 40 & 2 \text{ times } 16.
 \end{array}$$

$$\begin{array}{r}
 16 \\
 2\frac{1}{2} \\
 \hline
 8 \\
 32 \\
 \hline
 40
 \end{array}$$

Find the cost of:

14. $8\frac{1}{2}$ gal. oil @ \$.12.
15. $6\frac{1}{4}$ pk. potatoes @ \$.48.
16. $8\frac{1}{4}$ yd. silk @ \$1.20.
17. $7\frac{1}{2}$ yd. lace @ \$.16.
18. $6\frac{1}{4}$ doz. bananas @ \$.24.
19. $6\frac{1}{2}$ doz. buttons @ \$.54.
20. $7\frac{1}{2}$ doz. buttons @ \$.36.
21. $9\frac{1}{3}$ hours' work @ \$.18.
22. $8\frac{1}{4}$ lb. butter @ \$.48.
23. $6\frac{1}{2}$ yd. ribbon @ \$.16.
24. $7\frac{1}{4}$ pk. peaches @ \$.60.
25. $3\frac{1}{8}$ yd. muslin @ \$.16.

1. Divide 7284 by 600. 2. Divide 9754 by 800.

$$\begin{array}{r} 600 \overline{) 7284} \\ 12; \text{ r. } 84 \end{array}$$

$$\begin{array}{r} 800 \overline{) 9754} \\ 12; \text{ r. } 154 \end{array}$$

The number 84, cut off from the dividend, forms the remainder.

$97 \div 8 = 12$, with a remainder of 1 (hundred). The complete remainder is therefore 154.

3. Divide 48,525 by 2300.

$$\begin{array}{r} 21; \text{ r. } 225 \\ 2300 \overline{) 48525} \\ \underline{46} \\ 25 \\ \underline{23} \\ 225 \end{array}$$

$485 \div 23 = 21$, with a remainder of 2 (hundreds). Bring down the number 25 to form the complete remainder, 225.

Divide:

4. 76,856 by 2200

9. 68,025 by 4200

5. 86,040 by 3100

10. 56,078 by 2400

6. 86,075 by 2500

11. 70,642 by 4100

7. 40,673 by 3200

12. 47,630 by 5100

8. 87,604 by 2300

13. 85,763 by 1300

Find the quotients:

14. $869,325 \div 463$

19. $283,756 \div 268$

15. $739,186 \div 956$

20. $873,700 \div 945$

16. $293,869 \div 409$

21. $586,138 \div 715$

17. $891,382 \div 786$

22. $938,004 \div 807$

18. $632,007 \div 817$

23. $139,287 \div 800$

Little Carpenters



1. The drafting room is 24 feet wide and 28 feet long. What is the distance around the room?
2. There are 7 stands in the room. Each one costs \$5.50. What is the cost of all?
3. Each stand requires a "T" square, angles, scale, erasers, thumb-tacks, etc. The instruments cost \$28. What is the average cost of instruments for each stand?
4. The first class works 40 minutes on Monday and Friday of each school week. How many minutes are spent by the class during 4 school weeks?
5. Each of 7 boys requires a drafting board costing \$.59; ink, paper, pencils, etc., costing \$.25. What is the cost of these materials for the class?
6. The boys make 2 chairs valued at \$8.75 each, 3 stands at \$3.25 each, and 4 book racks at \$1.25 each. What is the value of all the articles?

The Cooking Class

1. It requires 4 yd. of material to make each of these girls an apron. How much is required for the class of 7 girls?

2. At \$.23 a yard for the material how much do 7 aprons cost?

3. From $9\frac{1}{2}$ yd. of lawn, how many caps, requiring $\frac{1}{2}$ yd. each, can be made? (Change to in.)

4. At \$.18 a yard, find the cost of lawn for sleeve protectors for 7 girls, each sleeve requiring $\frac{1}{2}$ yd.

5. How many pupils can be supplied with rolling pins and pie pans out of \$9, if each pin costs \$.20, and each pan \$.10 ?

6. Miss Dunn, the teacher, purchases the following: 7 flour cans @ \$.40, 7 cake pans @ \$.25, 7 sugar shakers @ \$.17. Find the amount of her purchases.

7. Entertaining the directors, this class uses 7 spring chickens @ \$.70, 3 pounds of rice @ \$.10, 1 head cabbage @ \$.08, 2 boxes tomatoes @ \$.15, $\frac{1}{2}$ lb. butter @ \$.48, 1 pt. cream @ \$.24, and $\frac{1}{2}$ gallon ice cream @ \$1.50. How much does the dinner cost them?



Taking Photographs



1. George bought a camera costing \$ 6.12 and 6 rolls of films for \$.24 each. How much change did he receive from a \$ 10 bill ?

2. Each picture was 2 inches by $3\frac{1}{4}$ inches. What was the number of square inches in its surface ?

3. The pictures were mounted on cardboard, with a margin of $\frac{1}{2}$ inch on each side. What was the length of the cardboard? the width? the number of square inches in the surface ?

4. It cost \$.18 to develop the roll of films. How much was this for each of the 6 exposures ?

5. A roll of films having 6 exposures cost \$.24, the developing for 6 exposures \$.18, the printing of each picture \$.03, and the mounting \$.02. What was the total cost of each picture ?

6. A picture $2\frac{1}{4}$ inches by $3\frac{1}{4}$ inches was mounted in the middle of a card $4\frac{3}{4}$ inches by $5\frac{3}{4}$ inches. How much margin was there on the card ?

7. How large a card would be needed to mount a picture $6\frac{1}{2}$ inches by $8\frac{1}{2}$ inches, leaving a margin of $3\frac{1}{2}$ inches on each side ?

Buying Groceries

Apples, \$2.25 a bushel.	Eggs, 48 ¢ a dozen.
Peaches, good, \$2.25 a bushel.	Nut butter, 28 ¢ a pound.
fancy, \$2.50 a bushel.	Dairy butter, 50 ¢ a pound.
Pears, \$1.50 a bushel.	Cheese, full cream, 30 ¢ a pound.
Grapes, Niagara, \$1.20 a 10-lb. basket.	American, 25 ¢ a pound.
Concord, \$1.25 a 10-lb. basket.	Potatoes, 50 ¢ a peck.

From the above prices find the cost of the following:

1. 8 bu. of fancy peaches.
2. $4\frac{1}{2}$ lb. of nut butter.
3. $5\frac{1}{2}$ pk. of potatoes.
4. 8 10-lb. baskets of Concord grapes.
5. 7 bu. of apples.
6. $4\frac{1}{2}$ cases of eggs, 30 dozen each.
7. 8 10-lb. baskets of Niagara grapes.
8. $8\frac{1}{2}$ pk. of potatoes.
9. 7 bu. of good peaches.
10. 9 full cream cheeses, 15 lb. each.
11. 7 10-lb. baskets of Concord grapes.
12. $9\frac{1}{2}$ bu. of pears.
13. 8 bu. of apples.
14. 7 lb. of dairy butter and 32 lb. of nut butter,
15. 8 bu. of fancy peaches and 42 bu., good quality.
16. 8 10-lb. baskets of Concord grapes, and 6 10-lb. baskets of Niagara grapes.

Find the products and test the answers:

- | <i>a</i> | <i>b</i> | <i>c</i> |
|------------------------|--------------------|--------------------|
| 1. $4 \times \$2.75$ | $7 \times \$82.93$ | $8 \times \$93.15$ |
| 2. $5 \times \$3.86$ | $8 \times \$46.25$ | $9 \times \$73.86$ |
| 3. $6 \times \$7.27$ | $9 \times \$73.87$ | $7 \times \$49.25$ |
| 4. Divide \$6.15 by 3. | | |

Divide \$6.15 by 3, placing a *decimal point directly under* the decimal point in the dividend. Write the dollar sign before the number of dollars in the quotient.

$$\begin{array}{r} 3 \overline{) \$6.15} \\ \$2.05 \end{array}$$

Find the quotients and test:

- | <i>a</i> | <i>b</i> | <i>c</i> |
|--------------------|-----------------|------------------|
| 5. $\$4.70 \div 2$ | $\$6.76 \div 4$ | $\$29.34 \div 9$ |
| 6. $\$2.08 \div 2$ | $\$8.22 \div 6$ | $\$46.72 \div 8$ |
| 7. $\$9.27 \div 3$ | $\$9.05 \div 5$ | $\$71.05 \div 7$ |

Find:

- | | | |
|------------------------------|--------------------------|--------------------------|
| 8. $\frac{1}{3}$ of \$27.15 | $\frac{1}{4}$ of \$16.64 | $\frac{1}{7}$ of \$39.34 |
| 9. $\frac{1}{2}$ of \$18.24 | $\frac{1}{5}$ of \$26.70 | $\frac{1}{8}$ of \$97.68 |
| 10. $\frac{1}{4}$ of \$20.48 | $\frac{1}{6}$ of \$38.40 | $\frac{1}{9}$ of \$27.36 |

Perform the operations indicated:

- | | | |
|-------------------------|---------------------|---------------------|
| 11. $\$273.84 \div 6$ | $\$263.76 \div 8$ | $\$375.42 \div 6$ |
| 12. $5 \times \$936.25$ | $9 \times \$423.96$ | $\$495.67 \div 7$ |
| 13. $6 \times \$475.83$ | $\$928.14 \div 6$ | $\$321.21 \div 9$ |
| 14. $\$721.98 \div 9$ | $\$743.68 \div 7$ | $8 \times \$563.94$ |
| 15. $\$435.76 \div 8$ | $\$269.19 \div 9$ | $6 \times \$732.75$ |

1. At \$.25 each, how many club pins can you buy for \$6.25?

$$\$6.25 = 625 \text{ ¢}$$

$$\$.25 = 25 \text{ ¢}$$

	25, Number of pins
Cost of 1 pin, 25 ¢	625 ¢, Money spent
	50
	<u>125</u>
	<u>125</u>

2. Richard's father lent him \$50 for a radio set. Richard paid back \$.50 a week. How many weeks did it take him to pay for the set?

3. Mrs. Elsen paid 45 cents a pound for butter for her boarding house. The amount of her bill was \$5.40. How many pounds did she buy?

4. Ruth bought silk at \$1.25 a yard and paid \$12.50. How many yards did she buy?

5. The manager of a hotel paid \$17.28 for 24 dozen fresh-laid eggs. What was the price per dozen?

6. How many bars of iron, weighing 56 lb. each, are equal in weight to a bar weighing 18,200 lb.?

7. A man sold land for \$45 an acre, receiving \$7200 for it. How many acres did he sell?

8. An orchard contained 4032 trees, planted in 32 rows. How many trees were there in a row?

9. A farm of 174 acres was sold for \$12,876. What was the selling price per acre?

10. Mother paid \$4.40 for a turkey at 55¢ a pound. What was the weight of the turkey?

These problems should be worked by writing the answers directly, without placing the multiplier under the multiplicand.

Find the cost of:

1. 3 houses @ \$2500.
2. 750 doz. buttons @ 30¢.
3. 60 hats @ \$1.25.
4. 48 chairs @ \$2.50.
5. 25 suits @ \$10.
6. 6 qt. salad oil @ \$.60.
7. 8 yd. silk @ \$1.25.
8. 150 yd. linen @ \$.30.
9. 12 lb. nut butter @ 25¢.
10. 25 doz. eggs @ 48¢.
11. 11 doz. lemons @ 30¢.
12. 15 pounds of lard @ 32¢.
13. 3 gal. maple sirup @ \$3.25.
14. 3 hams @ \$2.75.

Find the cost of 1 when:

29. 9 bbl. flour cost \$90.
30. 12 doz. oranges cost \$3.
31. 8 coats cost \$48.
32. 4 sheep cost \$22.
33. 15 lb. fish cost \$3.

Find the products:

15. $4 \times 30 =$
16. $10 \times 10 =$
17. $2 \times 25 =$
18. $5 \times 50 =$
19. $6 \times 60 =$
20. $8 \times 90 =$
21. $12 \times 50 =$
22. $11 \times 30 =$
23. $9 \times 25 =$
24. $10 \times 35 =$
25. $12 \times 12 =$
26. $12 \times 40 =$
27. $12 \times 15 =$
28. $12 \times 45 =$

Find the quotients:

34. $360 \div 9 =$
35. $328 \div 8 =$
36. $455 \div 7 =$
37. $156 \div 12 =$
38. $121 \div 11 =$

Time yourself in working these examples.

Find the cost of:

- | | |
|-----------------------|---------------------------|
| 1. 9 rings @ \$3. | 8. 10 vases @ \$2.39. |
| 2. 12 desks @ \$35. | 9. 10 horses @ \$95. |
| 3. 10 hats @ \$3.65. | 10. 11 books @ \$2.25. |
| 4. 10 bags @ \$1.50. | 11. 11 rugs @ \$4.75. |
| 5. 3 wagons @ \$85. | 12. 10 chairs @ \$5.25. |
| 6. 9 plates @ \$1.75. | 13. 6 chickens @ 75¢. |
| 7. 10 knives @ \$.75. | 14. 12 pictures @ \$4.50. |

Find the cost of 1 when:

- | | |
|-------------------------------|--------------------------------|
| 15. 12 lamps cost \$51. | 30. 10 satchels cost \$35.50. |
| 16. 4 cases cost \$32.48. | 31. 12 yd. lace cost 48¢. |
| 17. 10 sleds cost \$19.50. | 32. 11 lb. meat cost \$3.30. |
| 18. 10 rugs cost \$45. | 33. 6 qt. vinegar cost 72¢. |
| 19. 11 chairs cost \$35.75. | 34. 12 yd. silk cost \$18. |
| 20. 8 trunks cost \$57.60. | 35. 12 pk. tomatoes cost 84¢. |
| 21. 10 clocks cost \$48.50. | 36. 10 toy engines cost \$35. |
| 22. 5 hats cost \$15. | 37. 5 lb. meat cost \$1.50. |
| 23. 12 hats cost \$27. | 38. 8 yd. cambric cost \$1.60. |
| 24. 12 lb. rice cost 96¢. | 39. 4 bu. cherries cost \$15. |
| 25. 3 clocks cost \$9.75. | 40. 10 yd. silk cost \$17.50. |
| 26. 9 books cost \$11.25. | 41. 10 qt. milk cost \$1.50. |
| 27. 5 chairs cost \$15.45. | 42. 11 lb. butter cost \$5.50. |
| 28. 9 lb. nuts cost \$2.25. | 43. 3 pairs shoes cost \$9.75. |
| 29. 8 lb. prunes cost \$1.20. | 44. 12 collars cost \$2.40. |

The process of finding how many times one number contains another, or of separating a number into equal parts, is called **division**. *Sam*

1. How many times is \$3 contained in \$15?

This problem gives the *size* of the equal parts (\$3) into which the dividend (\$15) is to be divided, and asks for the *number* of equal parts. $\$15 \div \$3 = 5$, the *number* of equal parts.

2. What is the quotient of \$15 divided by 3?

This problem gives the *number* of equal parts (3) into which the dividend (\$15) is to be divided, and asks for the *size* of each part. $\frac{1}{3}$ of \$15 = \$5, the *size* of each part. This kind of division is called **partition**.

First state whether each problem calls for the *number* of equal parts or the *size* of each part, and then give answers:

3. $144 \text{ in.} \div 12 \text{ in.}$

7. $192 \text{ bu.} \div 16 \text{ bu.}$

4. $125 \text{ yd.} \div 5$

8. $108 \text{ in.} \div 9$

5. $\$132 \div \11

9. $\frac{1}{10}$ of \$250

6. $150 \text{ ft.} \div 10$

10. $\frac{1}{8}$ of 128 da.

11. At \$1.25 a bushel, how many bushels of corn will sell for \$62.50?

12. If 28 buggies are sold for \$2912, what is the average price?

13. If a train runs 1036 miles in 37 hours, how far will it run in one hour?

Buying Household Supplies

Potatoes, \$2.25 a bushel.

Beans, \$4.25 a bushel.

Butter, print, 55 ¢ a pound.

dairy, 53 ¢ a pound.

Sugar, 100-lb. bag, \$8.50.

Flour, \$10 a barrel.

Corn, \$1.25 a bushel.

Baked beans, 95 ¢ a dozen cans.

Celery, 10 ¢ a bunch.

Eggplant, 75 ¢ a dozen.

Watercress, 40 ¢ a dozen.

Blackberries, \$3.20 a crate.

At the prices above find the cost of each of the following :

1. 7 bu. potatoes.

7. 8 bu. corn.

2. 15 lb. print butter.

8. 10 bags sugar.

3. 30 bunches celery.

9. 25 bbl. flour.

4. 25 doz. watercress.

10. 2 doz. cans baked beans.

5. 5 bu. beans.

11. 7 doz. eggplants.

6. 12 lb. dairy butter.

12. 3 crates blackberries.

At $12\frac{1}{2}$ ¢ each find the cost of :

13. 72 yd. lace.

18. 176 cards buttons.

14. 144 books.

19. 272 collars.

15. 64 vases.

20. 128 yd. muslin.

16. 168 cups.

21. 96 melons.

17. 256 yd. lawn.

22. 152 yd. ribbon.

23. If 24 chairs cost \$44.40, what is the price of 1 chair?

24. James bought 10 lb. of sugar at 8 cents a pound ; 4 lb. of nut butter at 30 cents a pound ; 6 lemons at 3 cents apiece ; and two 10-cent loaves of bread. How much was his bill ?

On the Farm

1. A farmer has 28 cows in three fields. If there are 12 in the first, and 9 in the second, how many cows are there in the third field?
2. The farmer values his cows at an average of \$85 each. What is the value of all?
3. The fields over which they graze contain 24 acres, 18 acres, and 14 acres. How much grazing land is there, and what is the value of this land at $\$35\frac{1}{2}$ an acre?
4. The farmer receives 21,560 gallons of milk a year. How much is it worth at 40 cents a gallon?
5. His Jersey cow yields 350 lb. of butter a year, which he sells at \$.40 a pound. How much does he receive for it?
6. He sells 5 of the cows at an average price of \$88.50. How much does he receive for them?
7. He keeps 2 men at $\$42\frac{1}{2}$ a month each, to work on the farm. How much does the labor for the year cost?
8. He sells 14 calves for \$560. How much does he receive, on an average, for each?
9. His grocery bill averages $\$36\frac{1}{4}$ per month. Find his bill for the year.
10. He purchases 2 horses, one at \$325, and one at \$350; and 2 wagons at \$185 each. Repairs on the farm cost \$87.50. Find the amount paid.
11. He buys $1\frac{1}{2}$ doz. milk cans at \$1.20 each. How much do they cost?

$$.50 = \frac{1}{2} \text{ of } \$1.00$$

$$.10 = \frac{1}{10} \text{ of } \$1.00$$

$$.25 = \frac{1}{4} \text{ of } \$1.00$$

$$.75 = \frac{3}{4} \text{ of } \$1.00$$

Find by the shortest method the cost of:

1. 6 yards of linen at \$.50 a yard.

$$\text{SOLUTION. } 6 \times \$\frac{1}{2} = \$\frac{6}{2} = \$3.$$

2. 8 handkerchiefs at \$.25 each.
3. 8 yards of ribbon at \$.50 a yard.
4. 9 pounds of fish at \$.25 a pound.
5. 10 doz. lemons at \$.25 a dozen.
6. 9 yards of muslin at \$.10 a yard.
7. 6 neckties at \$.25 apiece.
8. 12 pictures at \$.75 each.
9. 10 yards of lawn at \$.10 a yard.
10. 5 gallons of vinegar at \$.50 a gallon.
11. 9 yards of lace at \$.50 a yard.
12. 10 dozen oranges at \$.75 a dozen.
13. 6 pounds of prunes at \$.10 a pound.
14. 16 pounds of rice at \$.10 a pound.
15. 12 bowls at \$.25 each.
16. 7 dozen oranges at \$.50 a dozen.

Change :

- | | |
|----------------------|-----------------------|
| 1. 60 ft. to yards. | 7. 5 ft. to inches. |
| 2. 28 rd. to feet. | 8. 120 in. to feet. |
| 3. 16 ft. to inches. | 9. 72 ft. to yards. |
| 4. 48 in. to feet. | 10. 420 in. to feet. |
| 5. 320 rd. to feet. | 11. 1250 yd. to feet. |
| 6. 1760 yd. to feet. | 12. 120 rd. to feet. |

13. How many feet of fence are required for a school garden in the form of an oblong 26 yards long and 12 yards wide?

14. James lives 180 rods from the schoolhouse. How many feet does he travel in going to and coming from school each day?

15. A boy travels 135 yards each day in carrying the mail. How many yards does he travel in 6 days? How much less than a mile does he travel?

16. Find the number of feet in 8 miles.

17. How many feet are there in 5 miles and 675 feet?

18. Change 2880 rods to miles.

19. John lives half a mile from the school. What is the distance in feet? What is the distance in rods?

20. How many feet are there in $1\frac{1}{2}$ miles?

21. Change 4 rods to feet; to yards.

Find the area in square inches of :

1. An oblong 4 in. by 6 in.
2. A square 7 in. on each side.
3. A page 5 in. by 8 in.
4. A pad 10 in. by 12 in.
5. An 8-in. square.
6. A 12-in. square.
7. A 9-in. square.
8. A 10-in. square.
9. Draw a figure to represent a book cover 3 in. wide and 5 in. long. Find its area. Find the distance around the oblong.

What is the distance around a figure called ?

10. Find the perimeter, in inches, of each figure described in problems 1 to 9.

Let 1 inch stand for 1 foot and draw the following figures. Find their areas and their perimeters :

11. A 6-foot square.
12. A rug 4 ft. by 9 ft.
13. A wall 6 ft. by 9 ft.
14. A table 5 ft. by 6 ft.

Let 1 inch stand for 1 yard and draw the following figures. Find their areas and the perimeters :

15. A schoolroom 8 yd. wide and 10 yd. long.
16. A hall 3 yd. wide and 15 yd. long.
17. A sidewalk 2 yd. wide and 12 yd. long.
18. Matting for a room 4 yd. wide and 5 yd. long.
19. Measure, in even yards, the length and the width of your schoolroom floor, and draw the figure on a convenient scale.

1. Write each of the following under its proper measure: oil, cheese, oats, hay, beans, potatoes, coal, cloth, molasses, sugar, rice, the surface of the blackboard, the width of the room, the length of the blackboard.

Change :

- | | |
|-----------------------------|-----------------------------|
| 2. 16 pt. to gallons. | 9. 72 pk. to bushels. |
| 3. 24 bu. to pecks. | 10. 3750 yd. to feet. |
| 4. 3 sq. ft. to sq. inches. | 11. 24 in. to feet. |
| 5. 17 yd. to feet. | 12. 6 mi. to rods. |
| 6. 120 ft. to inches. | 13. 360 ft. to yards. |
| 7. 50 lb. to ounces. | 14. 4860 in. to feet. |
| 8. 6 T. to pounds. | 15. 6966 sq. ft. to sq. yd. |

16. How many dozen oranges, and how many over, are there in a box containing 143 oranges? 165 oranges? 195 oranges?

17. Find the number of square inches in a vegetable bed 3 feet wide and 4 feet long.

18. The blackboard is 3 feet wide and 26 feet long. Find its surface in square feet.

19. A fruit dealer buys chestnuts at \$3 a bushel, and sells them at \$.10 a quart. Find his profit.

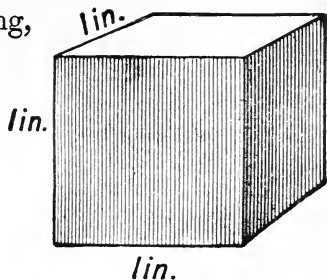
20. The schoolroom floor is 28 feet wide and 36 feet long. Find the number of square feet in the floor.

21. James lives 600 yards from the schoolhouse. How many feet does he walk in going to school in the morning and returning home in the afternoon?

L

This block or solid is 1 in. long, 1 in. wide, and 1 in. high.

It has six equal sides called faces, and each face contains 1 square inch.



A block or solid with 6 equal square faces is called a cube.

A cube whose faces are each a square inch contains 1 cubic inch, written 1 cu. in.

NOTE TO THE TEACHER. Secure 1-inch cubical blocks. Have pupils build solids, and count the number of cubic inches in each solid; the number of square inches on each face.

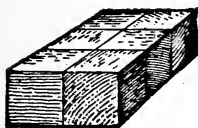


FIG. 1.

1. Build figure 1 with inch cubes. How many cubes does it take?

2. Build figure 2 with inch cubes. How many layers of blocks are there? How many blocks are there in each layer?

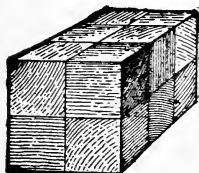


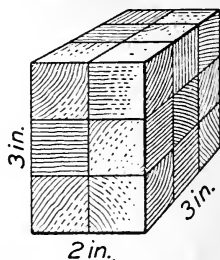
FIG. 2.

In 1 layer there are 6 cu. in.
In 2 layers there are 2×6 cu. in., or 12 cu. in. *Learn*
The number of cubic inches or cubic feet in a solid is called the **volume** or **contents** of the solid.

3. Build 12 blocks into a solid that has 4 blocks in each layer. How many layers are there?

1. Build a figure 2 in. by 3 in. by 3 in. with inch cubes. How many does it take? How many layers? How many are there in each layer? $3 \times 6 \text{ cu. in.} = 18 \text{ cu. in.}$ in the solid.

2. Build 10 other solids of different sizes with blocks, and ascertain the number of blocks in each.



3. The Christmas boxes sent to United States soldiers in France were 9 in. long, 4 in. wide, and 3 in. deep. How many cubic inches did they contain?

4. A brick is 8 in. long, 4 in. wide, and 2 in. thick. Find its volume in cubic inches.

5. A boy's book is 4 in. wide, 6 in. long, and 1 in. thick. Find the number of cubic inches in the book.

6. Mrs. Adams has a flower box that is 24 in. long, 8 in. wide, and 6 in. deep, inside measurement. How many cubic inches of soil will it take to fill it?

7. A square stick is 3 in. wide, 3 in. thick, and 12 in. long. How many cubic inches are there in the stick?

8. The inside of a box is 5 in. long, 4 in. wide, and 3 in. high. How many inch cubes can be built into it?

9. A schoolroom is 25 ft. wide, 30 ft. long, and 10 ft. high. How many pupils can be seated in this room, allowing 250 cu. ft. of air for each pupil?

Before you try to solve a problem, consider :

1. What facts are stated in the problem.
2. What kind of answer the question asks for.
3. By what steps the required answer can be found from the given facts.

1. How much is saved by buying 1 dozen jars of jelly for \$3.00 instead of buying the jars separately at \$.26 apiece ?

- | | |
|---|---|
| <p>\$.26, price of one jar.</p> <p>12, number of jars.</p> <hr/> <p>\$3.12, cost of 12 jars.</p> <p>3.00, lower cost.</p> <hr/> <p>\$.12, amount saved.</p> | <p>1. The facts stated are the price of a dozen jars and the price of a single jar.</p> <p>2. The question is, "What is the difference in price by the two methods of purchase?"</p> <p>3. First multiply \$.26 by 12; then subtract \$3 from this product.</p> |
|---|---|

2. Jean has \$5.75 and Paul has \$1.25 less. How much have both together ?

- | | |
|---|---|
| <p>\$5.75, amount Jean has.</p> <p>1.25, amount less Paul has.</p> <hr/> <p>\$4.50, amount Paul has.</p> <p>\$5.75, amount Jean has.</p> <p>4.50, amount Paul has.</p> <hr/> <p>\$10.25, amount both together have.</p> | <p>1. The facts stated are the amount Jean has and the amount less that Paul has.</p> <p>2. The question is, "What is the amount both together have?"</p> <p>3. First find Paul's amount by subtracting \$1.25 from \$5.75; then find the amount both have by adding Jean's and Paul's.</p> |
|---|---|

3. How much is saved on a dozen spools of thread by buying them at \$1.31 a dozen instead of at \$.12 a spool?

4. A man sells a farm for \$7625 and gains \$1685. Find the cost of the farm.

5. At a sale sport shirts are reduced from \$2.25 to \$.95. How much does a man save by buying 2 shirts at the sale?

1. George sold vegetables from his school garden in six days for the following sums: \$1.75, \$2.40, \$3.50, \$2.64, \$2.52, \$2.73. Find his average daily sales.

\$1.75

2.40

3.50

2.64

2.52

2.73

6) \$15.54, total for 6 days.
\$2.59, average each day.

1. The facts stated are the sales for each day.

2. The question is, "What is the daily average?"

3. First add all the sales; then divide by the number of days.

2. A creamery received milk for 6 days as follows: 7640 gallons, 8671 gallons, 9634 gallons, 8432 gallons, 8763 gallons, and 8604 gallons. What were the average daily receipts?

3. If Helen received 85 in arithmetic, 79 in grammar, 89 in history, 92 in geography, 86 in physiology, and 85 in writing, what was her average in these studies?

4. The attendance at a school was 604 on Monday, 607 on Tuesday, 598 on Wednesday, 603 on Thursday, 598 on Friday. What was the average daily attendance for the week?

5. The average temperature on Sunday was 74 degrees; on Monday, 87 degrees; on Tuesday, 80 degrees; on Wednesday, 85 degrees; on Thursday, 77 degrees; on Friday, 76 degrees; on Saturday, 74 degrees. Find the average daily temperature.

6. A laborer works 8 hours a day at \$.50 an hour. How many days does it take him to earn \$100?

1. A grocer opened an account and deposited in bank during the week the following sums: \$495.65, \$305.75, \$693.29, \$75.80, \$243.89, and \$375.77. He then had a balance to his credit of \$1200.15. How much had he withdrawn?

NOTE. First *estimate* the result mentally, as follows: $\$500 + \$300 + \$700 + \$75 + \$250 + \$375 = \$2200$; $\$2200 - \$1200 = \$1000$, approximate answer. Then find the exact result and compare the answers.

In examples 2 to 6, make a mental estimate and compare it with the exact result.

2. What is the value of 25 freight cars at \$476 each?

NOTE. As 25 is $\frac{1}{4}$ of 100, multiply 476 by 100 by adding two zeros, and divide the product by 4.

3. A man's salary was \$950 a year. He paid \$260 for board, \$136 for clothing, and \$115.75 for other expenses. How much had he left?

4. A grocer sold 8 doz. lemons at 36¢ a dozen and $13\frac{1}{4}$ lb. butter at 48¢ a pound. How much did he receive?

5. Anna bought for her mother:

8 lb. of coffee @ 28¢

24 oranges @ 5¢

$9\frac{1}{2}$ lb. of rice @ 8¢

8 cans of tomatoes @ 13¢

Find the amount of her purchases.

6. Find the cost of:

$27\frac{1}{2}$ lb. of fish @ 24¢

25 bottles of ammonia @ 8¢

$14\frac{3}{4}$ lb. of prunes @ 16¢

12 cans of peas @ 18¢

Saving Food and Fuel

1. How many pounds of meat are consumed in a day by 20,000,000 families who average $2\frac{1}{2}$ pounds a day?

2. If each of 20,000,000 families in the United States saves 1 ounce of meat daily, how many pounds will they all save in a day?



3. A saving of one slice of bread a day by every family will save 875,000 pounds of flour daily. How many pounds will be saved in a year of 365 days?

4. Three loaves of rye and cornmeal bread substituted each week for wheat bread by every family in the United States will save 33,000,000 pounds of wheat flour a week. How much does this amount to in 26 weeks?

5. The proper temperature of a room is 68° . If each of 20,000,000 families in the country saves a 5-pound shovelful of coal a day for 120 days, how many tons will be saved?

6. The more potatoes we eat, the less wheat we need. A potato weighing $1\frac{3}{4}$ ounces supplies as much starch as 1 slice of wheat bread. (a) How many ounces of potatoes should be substituted for a loaf of bread containing 20 slices? (b) How many pounds and ounces of potatoes?

(a) $20 \times 1\frac{3}{4} \text{ oz.} = ? \text{ oz.}$

7. If each of 102,000,000 people saves 2 pounds of sugar a month, how many pounds will be saved in 3 months? how many tons?

Add and test each example in 1 minute:

<i>a</i>	<i>b</i>	<i>c</i>
1. \$ 2785.00	\$ 5870.00	\$ 475.00
597.55	29.60	6000.00
3000.00	587.25	459.06
987.46	45.03	250.00
6750.00	6540.20	4278.64
5340.02	8750.00	5782.98
9876.54	2346.59	8796.32
<u>3201.89</u>	<u>4567.83</u>	<u>4123.56</u>

2. \$ 6004.50	\$ 6550.00	\$ 2987.35
887.95	278.93	500.83
504.06	8.10	6789.05
2874.59	200.02	200.06
850.00	7007.05	678.46
2250.05	520.84	4586.23
275.83	4265.63	2080.95
<u>7817.89</u>	<u>6005.80</u>	<u>2345.10</u>

3. \$ 475.00	\$ 1286.40	\$ 7665.00
6000.20	587.52	2050.50
579.80	3873.20	2002.02
1000.50	78.00	879.30
457.39	759.06	698.09
100.10	9300.00	5000.10
4555.05	759.84	898.45
<u>7016.89</u>	<u>5234.18</u>	<u>4987.56</u>

Subtract and test five examples in 1 minute:

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
1.	\$ 970.75 <u>387.68</u>	\$ 761.51 <u>137.49</u>	\$ 834.78 <u>209.99</u>	\$ 780.53 <u>489.95</u>
2.	\$ 781.32 <u>467.64</u>	\$ 892.31 <u>704.92</u>	\$ 721.20 <u>430.07</u>	\$ 500.62 <u>189.84</u>
3.	\$ 883.11 <u>579.64</u>	\$ 708.08 <u>597.79</u>	\$ 812.21 <u>721.26</u>	\$ 663.35 <u>487.95</u>
4.	\$ 776.43 <u>81.79</u>	\$ 800.31 <u>98.89</u>	\$ 721.05 <u>89.64</u>	\$ 322.91 <u>285.89</u>
5.	\$ 700.02 <u>127.76</u>	\$ 644.51 <u>394.82</u>	\$ 900.42 <u>289.65</u>	\$ 411.23 <u>309.88</u>
6.	\$ 900.76 <u>398.97</u>	\$ 544.34 <u>497.69</u>	\$ 645.25 <u>528.46</u>	\$ 205.34 <u>108.38</u>
7.	\$ 652.17 <u>489.79</u>	\$ 464.13 <u>389.84</u>	\$ 541.26 <u>409.68</u>	\$ 952.83 <u>503.24</u>
8.	\$ 725.74 <u>637.75</u>	\$ 908.22 <u>127.75</u>	\$ 851.02 <u>389.92</u>	\$ 734.99 <u>456.82</u>

Work and test each example in 1 minute:

- | | | |
|-----------------------|-----------------------|-----------------------|
| 1. 807×2045 | 8. 457×3087 | 15. 467×5934 |
| 2. 629×7708 | 9. 536×2946 | 16. 358×4572 |
| 3. 508×9430 | 10. 578×4352 | 17. 590×1742 |
| 4. 706×8075 | 11. 347×5238 | 18. 625×2834 |
| 5. 668×5638 | 12. 309×1378 | 19. 839×3456 |
| 6. 804×7652 | 13. 345×9203 | 20. 736×8754 |
| 7. 743×9536 | 14. 783×8736 | 21. 965×3420 |
| 22. 7892×435 | 29. 4759×803 | 36. $55,022 \div 82$ |
| 23. 4569×301 | 30. 3642×745 | 37. $44,302 \div 74$ |
| 24. 5238×763 | 31. 4758×546 | 38. $16,792 \div 81$ |
| 25. 8741×650 | 32. 9026×493 | 39. $28,644 \div 73$ |
| 26. 6329×485 | 33. 2984×367 | 40. $74,305 \div 37$ |
| 27. 5736×984 | 34. 8534×703 | 41. $83,265 \div 87$ |
| 28. 3492×807 | 35. 4736×750 | 42. $78,325 \div 75$ |
| 43. $85,679 \div 41$ | 50. $12,345 \div 154$ | 57. $70,504 \div 621$ |
| 44. $39,410 \div 52$ | 51. $67,890 \div 221$ | 58. $62,131 \div 905$ |
| 45. $80,624 \div 63$ | 52. $89,765 \div 336$ | 59. $88,776 \div 860$ |
| 46. $73,102 \div 74$ | 53. $43,210 \div 742$ | 60. $54,340 \div 408$ |
| 47. $81,103 \div 85$ | 54. $34,786 \div 819$ | 61. $82,107 \div 329$ |
| 48. $77,777 \div 96$ | 55. $57,602 \div 745$ | 62. $62,434 \div 752$ |
| 49. $88,888 \div 72$ | 56. $80,703 \div 613$ | 63. $93,785 \div 607$ |

Find how long it takes you to get the *right answers* to each set of five examples.

I

1. $5680 \times 398 = ?$
2. $8\frac{3}{4}$ ft. = how many inches?
3. $97,480 \div 943 = ?$
4. $\$893.54 - \$489.79 = ?$
5. $\$.76 + \$7.83 + \$56 = ?$

II

1. $84\frac{3}{8} + 57\frac{1}{8} = ?$
2. $6\frac{3}{4}$ bu. = how many quarts?
3. $10\frac{1}{2} + ? = 19\frac{1}{2}$.
4. $69\frac{3}{4} - 30\frac{1}{4} = ?$
5. $3\frac{1}{4} + 8\frac{3}{4} + 5 = ?$

III

1. $978 \times 800 = ?$
2. $9500 \div 59 = ?$
3. $\$894.39 \div 21 = ?$
4. $9\frac{1}{2}$ pk. = — qt.
5. Find the cost of 30 yd. silk @ \$2.75.

IV

Find the cost of:

1. 6 chairs @ \$8.75.
2. $3\frac{1}{2}$ doz. corn @ 60¢.
3. $3\frac{1}{4}$ lb. butter @ 64¢.
4. $4\frac{1}{8}$ yd. lace @ 16¢.
5. 4 yd. serge @ \$2.45.

V

1. $2\frac{1}{2} + \frac{1}{2} = ?$
2. $\frac{1}{4} + \frac{1}{8} = ?$
3. $\frac{1}{2} + \frac{1}{8} = ?$
4. $\frac{1}{2} - \frac{1}{4} = ?$
5. If $\frac{1}{8}$ yd. is cut from $3\frac{3}{8}$ yd., how much is left?

VI

Find the cost of:

1. $3\frac{1}{2}$ doz. pens @ 21¢.
2. $2\frac{1}{2}$ qt. milk @ 16¢.
3. $5\frac{3}{4}$ lb. steak @ 44¢.
4. $5\frac{3}{4}$ pk. pears @ 60¢.
5. $\$371.25 \div 75 = ?$

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ANSWERS TO

HAMILTON'S ESSENTIALS OF ARITHMETIC

LOWER GRADES

Page 55.—7. 68 apples. 8. 49 cakes. 9. 88 lemons. 10. 29 boys.
11. 38 chairs. 12. 49 books.

Page 58.—1. 23 children. 2. 34 heads. 3. 53¢. 4. 33¢. 5. 36 min.
6. 24 plants. 7. 42¢. 8. 21 pencils. 9. 27 children.

Page 60.—5. *a.* 65¢; *b.* 54¢; *c.* 82¢; *d.* 90¢; *e.* 70¢; *f.* 81¢;
g. 41¢. 6. *a.* 91 eggs; *b.* 92 nuts; *c.* 83 tops; *d.* 71 pens; *e.* 94 cups.
7. *a.* 80 pads; *b.* 93 caps; *c.* 51 bags; *d.* 95 pins; *e.* 90 hats.

Page 61.—1. 10 stamps. 2. 21¢. 3. 30 in. 4. 64 mi. 5. 27 cows.
6. 31 pieces. 7. 72 radishes. 8. 21 mi. 9. 31 children.

Page 62.—6. 11 games. 7. 42¢.

Page 63.—5. *a.* 17¢; *b.* 50¢; *c.* 88¢; *d.* 36¢; *e.* 49¢; *f.* 17¢;
g. 38¢. 6. *a.* 27¢; *b.* 69¢; *c.* 76¢; *d.* 80¢; *e.* 89¢; *f.* 74¢; *g.* 64¢.
7. *a.* 51¢; *b.* 47¢; *c.* 49¢; *d.* 47¢; *e.* 49¢; *f.* 49¢; *g.* 49¢. 8. *a.* 78¢;
b. 77¢; *c.* 75¢; *d.* 87¢; *e.* 73¢; *f.* 79¢; *g.* 86¢. 9. 18¢. 10. 27 radishes.

Page 64.—1. 16 stamps. 2. 25 stitches. 3. 63 radishes. 4. 39 seats.
5. 32 cows. 6. 58¢. 7. 42¢. 8. 34 books. 9. 64 stamps.
10. 84 beads. 11. \$41.

Page 67.—6. *a.* 120; *b.* 225; *c.* 198; *d.* 222; *e.* 240. 7. *a.* 390;
b. 315; *c.* 648; *d.* 924; *e.* 621. 8. *a.* 708¢; *b.* 900 yd.; *c.* 711 in.;
d. 774 ft.; *e.* 567¢.

Page 68.—1. \$48. 2. 160¢. 3. 28 jars. 4. 28¢. 5. 20¢.
6. 88¢. 7. 24¢. 8. 22¢. 9. 36 in. 10. 63 mi. 11. 48¢.
12. 180¢. 13. \$72. 14. 45¢.

Page 74.—9. *a.* 80 men; *b.* 53 balls; *c.* 242. 10. *a.* 102 ft.; *b.* 108 plants;
c. 309. 11. *a.* 106 yd.; *b.* 108 sheep; *c.* 403. 12. *a.* 305 books;
b. 401 in.; *c.* 72. 13. 40¢. 14. 24 qt. 15. 32 postcards.
16. \$44. 17. 32¢.

Page 77.—5. 40 yd. 6. 12 mi. 7. 32¢. 8. 28 da. 9. *a.* 260;
b. 152; *c.* 92; *d.* 276; *e.* 192; *f.* 224. 10. *a.* 372; *b.* 348; *c.* 296;
d. 300; *e.* 344; *f.* 392. 11. *a.* 328; *b.* 240; *c.* 420; *d.* 828; *e.* 760;
f. 800. 12. *a.* 936; *b.* 700; *c.* 832; *d.* 280; *e.* 396; *f.* 640.

Page 79.—1. 50¢; 75¢; 100¢. 2. 140¢. 3. 460¢. 4. 8 stamps; 4 stamps. 5. 24¢. 6. 50¢. 7. 48¢; 2¢. 8. 5¢. 9. 9¢.

Page 83.—2. a. 50; b. 40; c. 50; d. 70; e. 70; f. 70; g. 80.
3. a. 43; b. 53; c. 36; d. 55; e. 45; f. 43; g. 89. 4. a. 48; b. 28;
c. 74; d. 78; e. 94; f. 87; g. 92. 5. a. \$59; b. \$58; c. \$89; d. \$69;
e. \$87; f. \$88; g. \$66. 6. a. 65¢; b. 84¢; c. 78¢; d. 86¢; e. 78¢;
f. 58¢; g. 79¢. 7. a. 29 boys; b. 57 caps; c. 88 balls; d. 59¢; e. 68 ft.

Page 84.—2. a. 61; b. 71; c. 81; d. 90; e. 82; f. 62; g. 92.
3. a. 82; b. 43; c. 39; d. 54; e. 55; f. 63; g. 84. 4. a. 36; b. 52;
c. 52; d. 44; e. 82; f. 75; g. 77. 5. a. 71; b. 75; c. 56; d. 82; e. 77;
f. 80; g. 94. 6. a. 75; b. 93; c. 71; d. 39; e. 37; f. 73; g. 95.

Page 85.—1. \$41. 2. 91 bu. 3. 72 papers. 4. 80¢. 5. \$101.
6. 93 potatoes. 7. 70¢. 8. 82¢. 9. 51 min. 10. 113 jars.

Page 86.—1. 50 yd. 2. 75 yd. 3. 103 yd. 4. 208 yd. 5. 191
yd. 6. 91 yd. 7. 552 yd.; 1656 ft.

Page 88.—2. a. 22; b. 25; c. 43; d. 43; e. 26; f. 33; g. 22.
3. a. 25; b. 24; c. 53; d. 33; e. 35; f. 44; g. 44. 4. a. 33; b. 33;
c. 50; d. 50; e. 34; f. 53; g. 12. 5. a. 15; b. 14; c. 32; d. 70;
e. 40; f. 21; g. 4. 6. a. 61; b. 22; c. 23; d. 41; e. 14; f. 14; g. 9.

Page 89.—1. 2 hr. 2. 20¢. 3. 24 papers. 4. 44 mi. 5. 22
plants. 6. 42 pairs. 7. 62 A. 8. 13 mi. 10. 12 children.

Page 90.—2. a. 15; b. 28; c. 9; d. 24; e. 22; f. 41; g. 45.
3. a. 7; b. 23; c. 42; d. 44; e. 8; f. 33; g. 71. 4. a. 62; b. 27;
c. 56; d. 2; e. 24; f. 12; g. 27. 5. \$32. 6. 15¢.

Page 91.—2. a. 36; b. 23; c. 45; d. 19; e. 36; f. 17; g. 37.
3. a. 19; b. 54; c. 52; d. 19; e. 18; f. 28; g. 39. 4. a. 29; b. 18; c. 25;
d. 4; e. 18; f. 46; g. 16. 5. a. 18; b. 14; c. 6; d. 7; e. 13; f. 5; g. 9.
6. a. 29; b. 7; c. 8; d. 5; e. 47; f. 17; g. 19. 7. 35¢. 8. 19 jars.

Page 92.—1. a. 8; b. 8; c. 13; d. 7; e. 8; f. 37; g. 9. 2. a. 19¢.
b. 63¢; c. 49¢; d. 53¢; e. 46¢; f. 16¢; g. 33¢. 3. a. 28¢; b. 16¢;
c. 5¢; d. 17¢; e. 7¢; f. 23¢; g. 12¢. 4. a. 18¢; b. 14¢; c. 52¢;
d. 38¢; e. 4¢; f. 47¢; g. 11¢. 5. 42¢. 6. 27 qt. 7. 25 qt.
8. 13 girls. 9. 15 pages. 10. 44 flags.

Page 93.—1. 86¢. 2. 4¢. 3. 258¢. 4. 15¢. 5. 91¢.
6. 81¢. 7. 77¢. 8. \$18. 9. 47¢. 10. 25¢. 11. 83¢.

Page 94.—3. a. 17; b. 45; c. 236; d. 350; e. 182. 4. a. 23;
b. 15; c. 347; d. 453; e. 294. 5. a. 39; b. 29; c. 128; d. 251; e. 376.
8. a. 242; b. 223; c. 455; d. 250. 9. a. 128; b. 229; c. 269; d. 225.
10. 180 men; 57 balls; 374.

Page 95.—3. \$125. 4. \$132. 5. 200¢. 6. 117 pairs. 7. 32
hogs. 8. 213 baskets. 9. 41 boxes.

Page 97.—9. 84 men; 75 hr.; \$83; 174¢. 10. *a.* 845; *b.* 1417; *c.* 1855; *d.* 875; *e.* 1690. 11. *a.* 1188; *b.* 856; *c.* 273; *d.* 1400; *e.* 1401. 12. *a.* 1405; *b.* 1808; *c.* 550; *d.* 840; *e.* 401.

Page 93.—8. *a.* 1458; 1215; 972; 729; *b.* 3192; 2835; 2268; 1701; *c.* 894; 745; 596; 447; *d.* 4554; 3795; 3036; 2277; *e.* 5364; 4470; 3576; 2682. 9. *a.* 4074; 3395; 2716; 2037; *b.* 1770; 1475; 1180; 885; *c.* 1758; 1465; 1172; 879; *d.* 2304; 1920; 1536; 1152; *e.* 5034; 4195; 3356; 2517. 10. *a.* 5868; 4890; 3912; 2934; *b.* 5214; 4345; 3476; 2607; *c.* 4122; 3435; 2748; 2061; *d.* 4950; 4125; 3300; 2475; *e.* 5136; 4280; 3424; 2568. 11. *a.* 1242; 1035; 828; 621; *b.* 5340; 4450; 3560; 2670; *c.* 5418; 4515; 3612; 2709; *d.* 4248; 3540; 2832; 2124; *e.* 3630; 3025; 2420; 1815. 12. First column: \$240; \$420; \$540. Second column: 120¢; 210¢; 246¢. Third column: 480 men; 192 boys; 426 girls. Fourth column: 366 pens; 252 pads; 486 beads.

Page 99.—3. *a.* 80; *b.* 100; *c.* 104; *d.* 90; *e.* 61. 4. *a.* 120; *b.* 103; *c.* 41; *d.* 121; *e.* 102. 7. *a.* 141; *b.* 144; *c.* 105; *d.* 1207; *e.* 1449. 8. *a.* 112; *b.* 49; *c.* 140; *d.* 1268; *e.* 542. 10. 16 men. 11. 18 boxes.

Page 100.—1. *a.* 936; 1404; 1872; 2340; *b.* 912; 1368; 1824; 2280; *c.* 546; 819; 1092; 1365; *d.* 664; 996; 1328; 1660; *e.* 1268; 1902; 2536; 3170; *f.* 1698; 2412; 3216; 4020. 2. *a.* 1368; 2052; 2736; 3420; *b.* 1308; 1962; 2616; 3270; *c.* 744; 1116; 1488; 1860; *d.* 466; 699; 932; 1165; *e.* 872; 1308; 1744; 2180; *f.* 1944; 2916; 3888; 4860. 3. *a.* 472; 708; 944; 1180; *b.* 1128; 1692; 2256; 2820; *c.* 1464; 2196; 2928; 3660; *d.* 1096; 1664; 2192; 2740; *e.* 728; 1092; 1456; 1820; *f.* 1458; 2187; 2916; 3645. 4. *a.* 1264; 1896; 2528; 3160; *b.* 1084; 1626; 2168; 2710; *c.* 824; 1236; 1648; 2060; *d.* 970; 1455; 1940; 2425; *e.* 368; 552; 736; 920; *f.* 1816; 2724; 3632; 4540. 5. *a.* 2556; 2130; 1704; 1278; *b.* 5088; 4240; 3392; 2544; *c.* 2448; 2040; 1632; 1224; *d.* 4788; 3990; 3192; 2394; *e.* 1494; 1245; 996; 747; *f.* 1704; 1420; 1136; 852. 6. *a.* 1584; 1320; 1056; 792; *b.* 5064; 4220; 3376; 2532; *c.* 5040; 4200; 3360; 2520; *d.* 5382; 4485; 3588; 2691; *e.* 5652; 4710; 3768; 2826; *f.* 2568; 2140; 1712; 1284. 7. *a.* 3744; 3120; 2496; 1872; *b.* 5118; 4265; 3412; 2559; *c.* 2880; 2400; 1920; 1440; *d.* 4734; 3945; 3156; 2367; *e.* 2574; 2145; 1716; 1287; *f.* 5052; 4210; 3368; 2526. 8. *a.* 990; 825; 660; 495; *b.* 4740; 3950; 3160; 2370; *c.* 5886; 4905; 3924; 2943; *d.* 4074; 3395; 2716; 2037; *e.* 1542; 1285; 1028; 771; *f.* 5472; 4560; 3648; 2736. 9. *a.* 604; 302; *b.* 1356; 678; *c.* 600; 300; *d.* 632; 316. 10. *a.* 402; 201; *b.* 1578; 789; *c.* 584; 292; *d.* 956; 478. 11. *a.* 468; 234; *b.* 542; 271; *c.* 864; 432; *d.* 1120; 560. 12. *a.* 690; 345; *b.* 640; 320; *c.* 474; 237; *d.* 408; 204. 13. *a.* 912; 456; *b.* 436; 218; *c.* 464; 232; *d.* 438; 219. 14. *a.* 345; *b.* 320; *c.* 560; *d.* 410. 15. *a.* 456; *b.* 218; *c.* 478; *d.* 219. 16. *a.* 567; *b.* 406; *c.* 316; *d.* 637. 17. *a.* 678; *b.* 300; *c.* 280; *d.* 912. 18. *a.* 789; *b.* 325; *c.* 465; *d.* 1123.

Page 101.—1. \$29. 2. \$55. 3. \$1125. 4. 13 pupils. 5. \$20. 6. 20 tablecloths. 7. 120 stamps. 8. 57 boys. 9. 48¢. 10. 44 people. 11. 32 tickets. 12. 16 da.

Page 102.—5. 32 qt. 6. 2 qt.; 4 qt. 7. 16¢. 8. 48 qt. 9. 20 qt.; 2 pk. 10. 6 pk. 11. 4 qt.

Page 103.—5. 40 qt.; 10 gal. 6. 196¢. 7. 12 qt. 8. 24 pt.; 3 gal.
9. 2 pt. 10. 2 gal. 11. 8 qt. 12. 32 qt. 13. 4 qt. 14. 16 qt
15. 6 gal. 16. 3 qt. 17. 1 gal. 18. 20 qt.

Page 104.—2. $\frac{1}{2}$ lb. 3. 16 oz.; 1 lb. 4. 32 oz.; 2 lb. 5. 4 oz.;
8 oz. 6. 8 packages.

Page 105.—3. 1 lb. 4. 56¢. 5. 1 lb. 6. 16 oz. 7. 8 oz.
8. $\frac{1}{2}$ lb. 9. $\frac{1}{4}$ lb. 10. 32 oz. 11. 4 oz. 12. 16 oz. 13. 1 lb.
14. 4 oz. 15. 16 oz. 16. 1 lb. 17. 8 oz. 18. 132¢. 19. 96 oz.
20. 4 oz.; 24 oz. 21. 9¢.

Page 106.—6. 18 ft. 7. 36 in. 8. 1 yd. 9. 24 in. 10. 1 ft.
11. 6 yd. 12. 60 in. 13. 48 in. 14. 6 in. 15. 1 ft. 16. 5 yd.
17. 21 ft. 18. 72 in. 19. 3 in. 20. 4 in. 21. 12 ft. 22. 24 ft.
23. 9 yd. 24. 8 yd. 25. 7 yd. 26. 4 yd. 27. 72 ft. 28. 144 ft.
29. 108 ft. 30. 15 ft.

Page 107.—1. 50 yd. 2. 1080 ft. 3. 320 yd. 4. 72 in.; 2 yd.
5. 13 yd.; 1 ft. over. 6. 10 yd. 7. 64 in. 8. 60 in. 9. 45 in.
10. 300 yd. 11. 46 yd.; 2 ft. over. 12. 55 in.

Page 110.—5. 16 sq. in. 6. 16 sq. in. 8. 60 sq. ft. 9. 300 sq. in.

Page 111.—1. 150 lb. 2. 159 pages. 3. 128 lb. 4. 160 qt. 5. 54
mo. 6. \$4. 7. 6 mi. per hr.; 9 mi. per hr. 8. 338 pupils; 24 pupils.
9. 336 lb. 10. 720 pens. 11. 144 sheets. 12. 54¢.

Page 113.—2. 8 hr.; 8 hr. 5. 60 mo. 6. 156 wk.; 312 wk. 7. 42
da. 8. 144 hr. 9. 240 min.

Page 114.—8. *a.* 3192; *b.* 1855; *c.* 1099; *d.* 6741; *e.* 6328. 9. *a.*
54,173; *b.* 59,479; *c.* 43,386; *d.* 37,968; *e.* 44,373. 10. *a.* 32,851;
b. 52,696; *c.* 48,538; *d.* 60,032; *e.* 55,545. 11. *a.* 50,456; *b.* 39,879;
c. 17,283; *d.* 27,125; *e.* 56,658.

Page 115.—5. *a.* 12; *b.* 8; *c.* 8, r. 3; *d.* 9, r. 5; *e.* 6, r. 3; *f.* 5, r. 1.
6. *a.* 31; *b.* 52; *c.* 61; *d.* 91; *e.* 39; *f.* 99, r. 3. 7. *a.* 348; *b.* 1232;
c. 1242; *d.* 1309; *e.* 671. 8. *a.* 521; *b.* 1150; *c.* 513; *d.* 299; *e.* 1618.
9. *a.* 1055; *b.* 477; *c.* 362; *d.* 641; *e.* 996. 10. 37 bags. 11. 7 wk.
12. 12 suits. 13. 12 packages.

Page 116.—8. *a.* 49,840; *b.* 41,424; *c.* 69,032; *d.* 74,480; *e.* 62,920.
9. *a.* 23,496; *b.* 69,552; *c.* 72,664; *d.* 69,576; *e.* 58,312. 10. *a.* 72,384;
b. 55,496; *c.* 22,920; *d.* 37,640; *e.* 65,088.

Page 117.—11. *a.* 80; *b.* 90; *c.* 50; *d.* 40; *e.* 100. 12. *a.* 22;
b. 103; *c.* 78; *d.* 59; *e.* 76. 13. *a.* 1009; *b.* 262; *c.* 384; *d.* 511; *e.* 753.
14. *a.* 363; *b.* 1013; *c.* 374; *d.* 988; *e.* 1075. 15. 9 tablets. 16. 30¢.

Page 118.—9. *a.* 42,237; *b.* 65,574; *c.* 41,535; *d.* 78,642; *e.* 62,703.
10. *a.* 37,215; *b.* 25,866; *c.* 57,582; *d.* 16,821; *e.* 63,387.
11. *a.* 74,574; *b.* 33,273; *c.* 41,301; *d.* 26,037; *e.* 81,873.
12. *a.* 84,483; *b.* 26,505; *c.* 83,736; *d.* 57,204; *e.* 25,776.
13. *a.* 54,045; *b.* 71,046; *c.* 89,991; *d.* 54,810; *e.* 67,500

Page 119.—1. *a.* 38,034; *b.* 75,537; *c.* 34,074; *d.* 22,212; *e.* 74,889.
 2. *a.* 49,347; *b.* 60,228; *c.* 20,646; *d.* 74,961; *e.* 56,205.
 3. *a.* 57,564; *b.* 23,346; *c.* 44,712; *d.* 51,228; *e.* 84,366.
 4. *a.* 65,502; *b.* 65,214; *c.* 47,952; *d.* 66,474; *e.* 80,352.
 5. *a.* 56,736; *b.* 45,072; *c.* 63,810; *d.* 76,860; *e.* 57,456.
 6. 342 gal.; 216 da.; 144 min. 7. 153 bu.; 261 mo.; 225¢.

Page 120.—4. *a.* 293; *b.* 206, r. 2; *c.* 326; *d.* 854; *e.* 908.
 5. *a.* 709; *b.* 233; *c.* 343; *d.* 675; *e.* 804. 6. *a.* 941; *b.* 418;
c. 332; *d.* 245; *e.* 401. 7. *a.* 843; *b.* 699; *c.* 966; *d.* 276, r. 2;
e. 677. 9. 106 letters. 10. 4 times. 11. 9 melons.

Page 121.—1. 256 pt. 2. 234 mi. 3. 256¢. 4. 4 teams. 5. 17 lb.
 6. 21 plants. 7. 99 bu. 8. 99 gal. 9. 41 wk. 10. 33 da. 11. 13¢.
 12. 18 yd. 13. 12¢. 14. 7 hr. 15. 1152 sq. in.

Page 122.—1. 80 sq. ft. 2. 864¢. 3. 60 plants. 4. 120¢. 5. 5 ft.
 6. 84¢. 7. 75¢. 8. 90¢.

Page 124.—Set I: 2. 8 pk.; 12 pk. 3. 1122; 1096. 5. 26. Set II:
 1. 45. 2. 1st column: 77; 48; 2d column: 71; 84. 4. 8053. 5. 801.
 Set III: 1. \$201. 2. 64 qt. 3. 34; 42; 35; 43; 32. 4. 120 min.
 5. 72 hr. Set IV: 1. 90 pt. 2. 144 packages. 3. 997. 4. 113.
 5. 2781; 4858.

Page 127.—1. 2°. 2. 74°. 3. 180°. 4. 134°. 5. 9°. 6. 4°.
 7. 5°. 8. 52°. 9. 17°. 10. 38°.

Page 128.—2. *a.* 994; *b.* 820; *c.* 781; *d.* 1204; *e.* 831; *f.* 155.
 3. *a.* 1005; *b.* 853; *c.* 1733; *d.* 1442; *e.* 1490; *f.* 1932. 4. *a.* 968;
b. 962; *c.* 954; *d.* 1334; *e.* 189; *f.* 757. 5. *a.* 1397; *b.* 1006; *c.* 1338;
d. 1301; *e.* 1414; *f.* 1757. 6. *a.* 1720; *b.* 1425; *c.* 1951; *d.* 1636;
e. 1907; *f.* 2285.

Page 129.—2. *a.* 3695; *b.* 3494; *c.* 7421; *d.* 1763; *e.* 10,388.
 3. *a.* 7783; *b.* 5778; *c.* 10,805; *d.* 14,553; *e.* 11,997. 4. *Page 54.*
 1. *a.* 784; *b.* 1118; *c.* 2040; *d.* 1196; *e.* 553; *f.* 1250; *g.* 494.
 2. *a.* 2080; *b.* 1427; *c.* 1433; *d.* 1611; *e.* 1569; *f.* 1725; *g.* 994.
 3. *a.* 1411; *b.* 2021; *c.* 1335; *d.* 898; *e.* 1652; *f.* 711; *g.* 1098.
 4. *a.* 2179; *b.* 3125; *c.* 2244; *d.* 3510; *e.* 1920; *f.* 1991; *g.* 1913.
 5. *a.* 2245; *b.* 2153; *c.* 2498; *d.* 2730; *e.* 3386; *f.* 3398; *g.* 2716.

Page 130.—1. *a.* 35; *b.* 32; *c.* 28; *d.* 44; *e.* 43; *f.* 44. 2. *a.* 45;
b. 39; *c.* 354; *d.* 292; *e.* 312; *f.* 1483. 3. *a.* 356; *b.* 335; *c.* 376;
d. 439; *e.* 435; *f.* 1241.

Page 131.—1. *a.* 16,910; *b.* 20,524; *c.* 19,634; *d.* 18,184; *e.* 13,022.
 2. *a.* 18,330; *b.* 15,900; *c.* 16,996; *d.* 22,750; *e.* 21,607. 3. *a.* 21,010;
b. 24,150; *c.* 24,153; *d.* 26,261; *e.* 26,350.

Page 132.—2. *a.* 444; *b.* 468; *c.* 499; *d.* 182; *e.* 198; *f.* 209.
 3. *a.* 1030; *b.* 2092; *c.* 1987; *d.* 2305; *e.* 530; *f.* 118. 4. *a.* 4779;
b. 2708; *c.* 3062; *d.* 3378; *e.* 2428. 5. *a.* 3257; *b.* 3827; *c.* 2882;
d. 2457; *e.* 3018.

Page 133.—2. *a.* 346; *b.* 353; *c.* 222; *d.* 203; *e.* 428; *f.* 391.
 3. *a.* 37; *b.* 412; *c.* 273; *d.* 239; *e.* 19; *f.* 3. 4. *a.* 106; *b.* 555;
c. 31; *d.* 9; *e.* 152; *f.* 262. 6. *a.* 395; *b.* 251; *c.* 252; *d.* 291;
e. 451; *f.* 325. 7. *a.* 192; *b.* 409; *c.* 123; *d.* 107; *e.* 180; *f.* 174.

Page 134.—1. *a.* 2256; *b.* 1873; *c.* 2596; *d.* 4117; *e.* 7359.
 2. *a.* 3009; *b.* 2808; *c.* 2999; *d.* 1088; *e.* 589. 3. *a.* 2878; *b.* 2648;
c. 1689; *d.* 1958; *e.* 3488. 4. *a.* 2789; *b.* 1366; *c.* 3479; *d.* 4479;
e. 2522. 5. *a.* 3136; *b.* 5591; *c.* 3239; *d.* 1812; *e.* 2541. 6. *a.* 1084;
b. 2293; *c.* 4986; *d.* 1766; *e.* 3844. 7. *a.* 3939; *b.* 2814; *c.* 1285;
d. 1832; *e.* 4809. 8. *a.* 3226; *b.* 1778; *c.* 1343; *d.* 2244; *e.* 950.
 9. 16,661. 10. 18,509. 11. 15,823. 12. 15,647. 13. 13,602.
 14. 13,685. 15. 10,878. 16. 12,246. 17. 16,853. 18. 23,280.
 19. 16,508. 20. 22,856. 21. 21,697. 22. 24,590. 23. 12,835.
 24. 21,265. 25. 19,906. 26. 22,014. 27. 20,432. 28. 23,239.

Page 135.—2. *a.* 2156; *b.* 2396; *c.* 1108; *d.* 1813; *e.* 5001.
 3. *a.* 2987; *b.* 2695; *c.* 1197; *d.* 991; *e.* 172. 4. *a.* 6503; *b.* 240;
c. 1791; *d.* 5098; *e.* 1363. 5. *a.* 1100; *b.* 3631; *c.* 3619; *d.* 1414;
e. 203. 6. *a.* 3695; *b.* 1070; *c.* 1192; *d.* 2504; *e.* 4893. 7. *a.* 2097;
b. 2802; *c.* 295; *d.* 1308; *e.* 1503. 8. *a.* 2253; *b.* 1651; *c.* 2675;
d. 1973; *e.* 4011. 9. *a.* 1196; *b.* 3889; *c.* 1651; *d.* 2266; *e.* 2089.

Page 136.—1. 625 stamps. 2. 3749 pupils. 3. 3712 ft. 4. 4385
 people. 5. 1511 boys. 6. 5437 flags. 7. 430 steps. 8. 440 fares.

Page 137.—3. *a.* \$125.81; *b.* \$141.90; *c.* \$56.75; *d.* \$569.07.
 4. *a.* \$164.15; *b.* \$184.24; *c.* \$162.68; *d.* \$222.82. 5. *a.* \$108.08;
b. \$228.47; *c.* \$131.79; *d.* \$463.51. 6. *a.* \$602.92; *b.* \$765.69;
c. \$437.07; *d.* \$622.92. 7. *a.* \$190.65; *b.* \$78.25; *c.* \$210.64;
d. \$223.15. 8. *a.* \$176.80; *b.* \$281.06; *c.* \$153.25; *d.* \$110.42.

Page 138.—1. *a.* \$913.87; *b.* \$2489.87; *c.* \$2269.27; *d.* \$2624.92.
 2. *a.* \$1444.03; *b.* \$1521.75; *c.* \$1347.07; *d.* \$902.09. 3. *a.* \$1412.07;
b. \$172.80; *c.* \$1244.99; *d.* \$1843.41. 4. *a.* \$279.08; *b.* \$256.29;
c. \$242.91; *d.* \$626.04. 5. *a.* \$97.77; *b.* \$28.39; *c.* \$167.51;
d. \$138.60. 6. *a.* \$71.62; *b.* \$65.82; *c.* \$263.13; *d.* \$507.57.

Page 139.—1. *a.* \$75.06; *b.* \$87.08; *c.* \$66.01; *d.* \$75.26;
e. \$52.03. 2. *a.* \$163.61; *b.* \$181.53; *c.* \$156.05; *d.* \$241.92;
e. \$255.09. Total, \$998.20. Corn, \$323.45; oats, \$128.76; bran, \$35.95;
 chop, \$69.89; meal, \$46.40; flour, \$393.75. 3. \$355.55. 4. \$11.55.

Page 140.—3. 12¢. 4. 22¢. 5. 9¢. 6. 17¢. 7. 15¢.
 8. 12¢. 9. 22¢. 10. 2¢.

Page 141.—1. 9¢. 2. 19¢. 3. 8¢. 4. 5¢. 5. 15¢. 6. 20¢.
 7. 18¢. 8. 5¢. 9. 34¢. 10. 32¢. 11. 13¢. 12. 40¢. 13. 10¢.

Page 142.—1. \$28.09. 2. \$1.49. 3. \$3.19. 4. \$.90.
 5. \$23.72. 6. \$4.09. 7. 18 badges. 8. 21 strokes. 9. 64 sq. in.
 10. 71 oranges. 11. 3 five-dollar bills, \$2.86 over.

Page 143.—2. 846 bu. 3. \$103. 4. 184 da. 5. \$16,995.
 6. \$6572. 7. 108 ft. 8. 187 mi.

Page 144.—7. 50¢. 8. \$50. 9. 25¢. 10. 120¢. 11. 90¢.
12. 120¢. 13. 140¢. 14. 800¢.

Page 145.—6. 6 periods. 7. 9 lb. 8. 14 hr. 9. 5¢.

Page 147.—4. First column: 5580; 5115. 6552; 6006. 9408; 8624. 9420; 8635. 11,736; 10,758. Second column: 2832; 2596. 9396; 8613. 11,244; 10,307. 6168; 5654. 8328; 7634. Third column: 9468; 8679. 11,136; 10,208. 8316; 7623. 11,256; 10,318. 3552; 3256. 6. a. 1824 nuts; b. \$3168; c. 4452¢; d. 5616; e. 1872. 7. a. 4608 trees; b. \$9360; c. 6348¢; d. 9540; e. 6948. 8. a. 3492 ships; b. \$2772; c. 7248¢; d. 4860; e. 2808. 9. 7344 eggs. 10. 2352 lb.

Page 148.—4. 249. 5. 754. 6. 185. 7. 632. 8. 362. 9. 273.
10. 811. 11. 196. 12. 732. 13. 6341. 14. 6642. 15. 8190.
19. 306. 20. 405. 21. 580. 22. 602. 23. 391. 24. 651.
25. 237. 26. 769. 27. 390. 28. 782. 29. 3516. 30. 5781.
31. 6162. 32. 6888. 33. 3108. 34. 7656. 35. 2060. 36. 5696.
37. 6814. 38. 7697.

Page 149.—2. a. 394, r. 1; b. 94, r. 2; c. 396, r. 1; d. 562, r. 6.
3. a. 116, r. 1; b. 71, r. 3; c. 145, r. 5; d. 486, r. 1. 4. a. 59, r. 2; b. 55, r. 3; c. 233, r. 1; d. 792, r. 2. 5. a. 132, r. 1; 88, r. 1; b. 432; 288; c. 393; 262; d. 312; 208; e. 3684; 2456. 6. a. 356, r. 1; 237, r. 2; b. 109, r. 1; 73; c. 134, r. 1; 89, r. 2; d. 289; 192, r. 2; e. 1228, r. 1; 819.
7. a. 67; 53, r. 3; b. 234; 187, r. 1; c. 1745, r. 1; 1396, r. 1; d. 968, r. 2; 774, r. 4; e. 1219; 975, r. 1. 8. a. 216; 172, r. 4; b. 117; 93, r. 3; c. 1258, r. 2; 1006, r. 4; d. 547, r. 2; 438; e. 960, r. 1; 768, r. 1.
9. a. 56, r. 1; 45; b. 84, r. 2; 67, r. 3; c. 505, r. 1; 404, r. 1; d. 750; 600; e. 749, r. 3; 599, r. 4.

Page 152.—9. 14,200. 10. 25,500. 11. 98,000. 12. 500,500.
13. 6940. 14. 12,270. 15. 42,900. 16. 26,320. 17. 42,750.
18. 146,500. 19. 550,200. 20. 73,600. 21. 477,600. 22. 166,400.
23. 96,200. 24. 357,600. 25. 634,200. 26. 655,200. 27. 43,800.

Page 154.—14. 20 cans. 15. 50 packages. 16. 5 lb. 17. 120 coats. 18. 35 mo.

Page 155.—6. a. 14,472; b. 20,640; c. 20,712; d. 26,775; e. 34,658.
7. a. 20,884; b. 23,256; c. 48,111; d. 45,449; e. 33,813. 8. a. 11,200; b. 14,700; c. 61,422; d. 45,471; e. 71,732.

Page 156.—1. 9798. 2. 15,252. 3. 8448. 4. 9824. 5. 11,567.
6. 8289. 7. 19,368. 8. 46,368. 9. 25,324. 10. 23,458.
11. 21,754. 12. 28,992. 13. 29,160. 14. 77,658. 15. 54,826.
16. 82,592. 17. 54,450. 18. 9772. 19. 432,288. 20. 202,050.
21. 304,076. 22. 287,631. 23. 355,992. 24. 207,718. 25. 352,408.
26. 52,780. 27. 73,818. 28. 33,799. 29. 78,792. 30. 828,996.
31. 304,854. 32. 243,404. 33. 361,959. 34. 13,824 sheets.
35. 1853 mi.

Page 157.—2. 173,250. 3. 154,375. 4. 68,769. 5. 97,188.
 6. 79,232. 7. 355,266. 8. 143,352. 9. 400,792. 10. 152,055.
 11. 272,527. 12. 436,792. 13. 925,806. 14. 374,274. 15. 79,086.
 16. 78,684. 17. 816,249. 18. 510,130. 19. 734,454. 20. 128,425.
 21. 707,277. 22. 739,692. 23. 345,066. 24. 477,240. 25. 24,500 lb.
 26. 42,344 pupils.

Page 158.—2. *a.* 158,632; *b.* 84,150; *c.* 173,340; *d.* 155,342;
e. 360,172. 3. *a.* 74,844; *b.* 357,336; *c.* 127,072; *d.* 566,820; *e.* 551,156.
 6. 267,814. 7. 142,080. 8. 89,760. 9. 209,588. 10. 113,800.
 11. 179,000. 12. 185,240. 13. 450,600. 14. 154,736. 15. 725,600.

Page 159.—14. 573; 203, r.10; 262; 609. 15. 8070; 7470; 506; 755.

Page 160.—5. 21; 32; 43.

Page 161.—1. 12. 2. 25. 3. 41. 4. 34. 5. 31. 6. 17.
 7. 24. 8. 114, r. 4. 9. 125. 10. 23. 11. 29. 12. 217. 13. 203.
 14. 312. 15. 412. 16. 119, r. 30. 17. 32. 18. 210. 19. 62.
 20. 71. 21. 33.

Page 162.—1. 42. 2. 43. 3. 24. 4. 39. 5. 15. 6. 27.
 7. 19. 8. 21. 9. 40. 10. 29. 11. 16. 12. 30. 13. 25.
 14. 32. 15. 42. 16. 6. 17. 25. 18. 24. 19. 29. 20. 7.
 21. 21. 22. 29. 23. 5. 24. 6. 25. 14. 26. 26. 27. 17.
 28. 19. 29. 23. 30. 56. 31. 27. 32. 35. 33. 24. 34. 38.
 35. 40. 36. 41. 37. 31. 38. 160. 39. 220. 40. 32. 41. 33.
 42. 72. 43. 64. 44. 28. 45. 29. 46. 44. 47. 45. 48. 36.
 49. 895 bu. 50. 9 hr. 51. 14 hr. 52. 216 bu.

Page 163.—2. 47. 3. 45, r. 18. 4. 62. 5. 77, r. 19.
 6. 247, r. 2. 7. 67, r. 18. 8. 83, r. 19. 9. 77, r. 19. 10. 53, r. 61.
 11. 62. 12. 41. 13. 61. 14. 63, r. 2. 15. 65, r. 44. 16. 77.
 17. 44, r. 56. 18. 59, r. 60. 19. 47. 20. 76, r. 6. 21. 86, r. 2.
 22. 83, r. 23. 23. 24, r. 55. 24. 73, r. 76. 25. 183, r. 22.
 26. 52, r. 30. 27. 94, r. 84. 28. 318, r. 21. 29. 8 bbl. 30. 8 bbl.;
 4 gal. over. 31. 4 buildings.

Page 164.—2. 572, r. 10. 3. 804. 4. 503. 5. 906. 6. 702.
 7. 608. 8. 305. 9. 801. 10. 802. 11. 203. 12. 504.
 13. 708. 14. 913, r. 34. 15. 308, r. 53. 16. 768, r. 15. 17. 705.
 18. 404, r. 48. 19. 507. 20. 850, r. 96. 21. 807. 22. 604.

Page 165.—1. *a.* 186,230; *b.* 380,925; *c.* 423,250; *d.* 727,990;
e. 643,340; *f.* 829,570; *g.* 474,040; *h.* 584,085. 2. *a.* 168,190;
b. 344,025; *c.* 382,250; *d.* 657,470; *e.* 581,020; *f.* 749,210; *g.* 428,120;
h. 527,505. 3. *a.* 192,392; *b.* 393,345; *c.* 437,050; *d.* 751,726;
e. 664,316; *f.* 856,618; *g.* 489,496; *h.* 603,129. 4. *a.* 216,920;
b. 443,700; *c.* 493,000; *d.* 847,960; *e.* 749,360; *f.* 966,280; *g.* 552,160;
h. 680,340. 5. *a.* 185,350; *b.* 379,125; *c.* 421,250; *d.* 724,550;
e. 640,300; *f.* 825,650; *g.* 471,800; *h.* 581,325. 6. *a.* 212,388;
b. 434,430; *c.* 482,700; *d.* 830,244; *e.* 733,704; *f.* 946,092; *g.* 540,624;
h. 666,126. 7. *a.* 173,118; *b.* 354,105; *c.* 393,450; *d.* 676,734;
e. 598,044; *f.* 771,162; *g.* 440,664; *h.* 542,961. 8. *a.* 214,830;
b. 439,425; *c.* 488,250; *d.* 839,790; *e.* 742,140; *f.* 956,970; *g.* 546,840.

h. 673,785. 11. a. 985, r. 55; b. 1086, r. 57; c. 931, r. 44; d. 1436, r. 41; e. 1177, r. 21; f. 1265, r. 10; g. 1033, r. 59; h. 1304, r. 5.
 12. a. 670, r. 52; b. 739, r. 30; c. 633, r. 69; d. 977, r. 29; e. 801; f. 860, r. 52; g. 703, r. 26; h. 887, r. 17. 13. a. 938, r. 52; b. 1034, r. 68; c. 887, r. 3; d. 1368, r. 8; e. 1121, r. 8; f. 1204, r. 52; g. 984, r. 32; h. 1241, r. 55. 14. a. 589, r. 70; b. 650, r. 24; c. 557, r. 37; d. 859, r. 43; e. 704, r. 36; f. 757, r. 5; g. 618, r. 48; h. 780, r. 24.
 15. a. 708, r. 37; b. 781, r. 7; c. 669, r. 46; d. 1032, r. 37; e. 846, r. 13; f. 909, r. 22; g. 742, r. 81; h. 937, r. 20. 16. a. 1004, r. 68; b. 1107, r. 66; c. 949, r. 53; d. 1464, r. 36; e. 1200, r. 12; f. 1289, r. 49; g. 1053, r. 66; h. 1329, r. 27. 17. a. 888, r. 44; b. 979, r. 50; c. 839, r. 63; d. 1295, r. 7; e. 1061, r. 20; f. 1140, r. 32; g. 931, r. 70; h. 1175, r. 37.
 18. a. 970, r. 36; b. 1069, r. 74; c. 917, r. 9; d. 1414, r. 30; e. 1159, r. 8; f. 1245, r. 41; g. 1017, r. 62; h. 1283, r. 61. 19. \$85. 20. 229 calves.

Page 166.—9. a. 504, r. 92; b. 346, r. 75; c. 41. 10. a. 230, r. 133; b. 322; c. 199, r. 90. 11. a. 339, r. 26; b. 256, r. 95; c. 32, r. 442. 12. a. 75, r. 236; b. 427, r. 66; c. 201, r. 350. 13. a. 283, r. 90; b. 302, r. 247; c. 215, r. 119. 14. a. 382, r. 103; b. 441, r. 136; c. 208, r. 220.

Page 169.—4. 260 ft. 5. 14 ft. 6. 160 rd.; 140 rd. 7. 150 ft. 8. 3 ft. 9. 120 in. 10. 4 yd. 11. 9 ft. 12. 2 rd. 13. 11 yd. 14. 2 mi. 15. 960 rd. 16. 2 mi. 17. 15,840 ft. 18. 3 mi. 19. 3200 rd.

Page 170.—5. 1152 sq. in. 6. 6 sq. ft. 7. 90 sq. ft.

Page 171.—5. 108 sq. ft. 6. 1200 sq. ft. 8. 8 sq. ft. 9. 432 sq. in. 10. 2 sq. ft. 11. 720 sq. in. 12. 3 sq. yd. 13. 45 sq. ft.

Page 172.—5. 180 sec. 6. 144 hr. 7. 420 min. 8. 78 hr. 9. 76 da. 10. 91 da.; 92 da.

Page 173.—2. 90 min. 3. 240 min.; 4 hr. 4. 180 min.; 3 hr. 5. 45 min. 6. 35 min. 7. 90 hr. 8. 120 strokes. 9. 28 ϕ . 10. 10 hr.

Page 174.—4. 16,000 lb.; 14,000 lb.; 24,000 lb. 5. 3 T. 1460 lb. 6. 30 T. 7. 6 T. 1500 lb. 8. 2 lb. 9. 4 lb. 10. 80 oz. 11. 64 oz. 12. 2 T. 13. 4 T. 14. 10,000 lb. 15. 20,000 lb.

Page 175.—1. 48 ϕ . 2. 4000 packages. 3. 2 T. 4. 2000 lb. 5. 60 bags. 6. 192 ϕ . 7. 384 oz. 8. 864 ϕ . 9. 3 T. 500 lb. 10. 6000 lb.; 10,000 lb.; 16,000 lb. 11. 1 T. 720 lb. 12. 85 packages. 13. 161 oz.

Page 177.—1. 1 pt. 2. 1 qt. 3. 1 qt. 4. 8 oz. 5. 30 min. 6. 15 min. 7. 3 hr. 8. 6. 9. 3. 10. 2 qt. 11. 30 sec. 12. 6 hr. 13. 2 qt. 14. 4 oz. 15. 2 oz. 16. 2640 ft. 17. 160 rd. 18. 72 sq. in. 19. 1320 ft. 20. 660 ft. 21. $\frac{3}{4}$ lb. 22. 45 min. 23. $\frac{1}{8}$ yd. 24. $\frac{3}{4}$ yd. 25. 7 ϕ . 26. 3 ϕ . 27. 20 ϕ .

Page 178.—1. \$60. 2. 780 members. 3. 18,341 articles 4. 216 sq. in. 5. \$592. 6. \$88.74. 7. 444 children.

Page 179.—1. 22,203. 2. 29,322. 3. 86,526. 4. 25,524.
 5. 82,845. 6. 48,545. 7. 64,302. 8. 19,138. 9. 59,969.
 10. 14,959. 11. 49,904. 12. 11,672. 13. 74,760. 14. 22,112.
 15. 26,280. 16. 37,764. 17. 44,316. 18. 55,686. 19. 29,616.
 20. 55,650. 21. 1017, r. 7. 22. 336, r. 7. 23. 922, r. 2.
 24. 786, r. 3. 25. 974, r. 3. 26. 321, r. 4. 27. 693, r. 4. 28. 787.
 29. 1233, r. 6. 30. 292, r. 5. 31. 1323, r. 6. 32. 1046, r. 6.
 33. 1404, r. 1. 34. 1073, r. 1. 35. 1562, r. 3. 36. 1360, r. 2.

Page 180.—Set I: 1. 141,372. 3. \$125.13. 4. 108, r. 54. 5. 809.
 Set II: 1. \$13.53. 2. 34, r. 27. 3. $\frac{7}{8}$. 4. 547,400. 5. 109, r. 76.
 Set III: 1. 100,000. 2. 5753. 3. 940, r. 60. 5. 254,040.
 Set IV: 1. 936. 2. 204,452. 3. 403, r. 29. 4. 121. 5. 7006.
 Set V: 1. \$66.32. 2. 92, r. 693. 3. \$766,080. 5. 102. Set VI:
 1. 9009. 2. 175. 3. 190, r. 174. 4. $\frac{1}{4}$. 5. \$62,100.

Page 183.—1. a. \$3569.11; b. \$1980.73; c. \$3351.74; d. \$7801.11.
 2. a. \$2578.31; b. \$4340.01; c. \$5037.33; d. \$12,154.59. 3. a. \$3490.40;
 b. \$3565.92; c. \$3355.63; d. \$11,631.90.

Page 184.—1. a. \$211.70; b. \$128.45; c. \$1979.02; d. \$33,812.37.
 2. a. \$310.20; b. \$227.74; c. \$724.73; d. \$15,577.79. 3. a. \$923.68;
 b. \$296.88; c. \$8694.69; d. \$17,950.52. 4. a. \$387.06; b. \$218.02;
 c. \$2563.59; d. \$17,619.20. 5. a. \$346.06; b. \$423.08; c. \$3148.92;
 d. \$7986.86. 6. a. \$563.00; b. \$651.94; c. \$4129.37; d. \$5873.83.
 7. a. \$754.85; b. \$252.05; c. \$2463.54; d. \$57,529.24. 8. a. \$108.03;
 b. \$323.52; c. \$3241.08; d. \$17,879.01. 9. a. \$452.83; b. \$672.20;
 c. \$5061.44; d. \$14,140.29.

Page 185.—4. a. \$7; b. \$12.20; c. \$18.15; d. \$47; e. \$28.16.
 5. a. \$3; b. \$.24; c. \$2.96; d. \$2.45; e. \$4.75. 6. \$1.95. 7. \$1.80.
 8. \$39. 9. \$9. 10. \$28.08.

Page 186.—1. \$3.84. 2. \$1.96. 3. \$18.60. 4. \$3.36. 5. \$4.50.
 6. \$20. 7. \$2.88. 8. \$5.12. 9. \$2.56. 10. \$12.25. 11. \$1.86.
 12. By 7: a. \$29.89; b. \$43.26; c. \$49; d. \$37.45. By 10: a. \$42.70;
 b. \$61.80; c. \$70; d. \$53.50. By 24: a. \$102.48; b. \$148.32; c. \$168;
 d. \$128.40. By 236: a. \$1007.72; b. \$1458.48; c. \$1652; d. \$1262.60.
 13. By 7: a. \$67.55; b. \$260.75; c. \$6.09; d. \$47.25. By 10: a. \$96.50;
 b. \$372.50; c. \$8.70; d. \$67.50. By 24: a. \$231.60; b. \$894; c. \$20.88;
 d. \$162. By 236: a. \$2277.40; b. \$8791; c. \$205.32; d. \$1593. 14. By
 7: a. \$3.36; b. \$26.88; c. \$48.65; d. \$31.08. By 10: a. \$4.80;
 b. \$38.40; c. \$69.50; d. \$44.40. By 24: a. \$11.52; b. \$92.16; c. \$166.80;
 d. \$106.56. By 236: a. \$113.28; b. \$906.24; c. \$1640.20; d. \$1047.84.
 15. By 7: a. \$3.50; b. \$66.50; c. \$34.23; d. \$69.93. By 10: a. \$5;
 b. \$95; c. \$48.90; d. \$99.90. By 24: a. \$12; b. \$228; c. \$117.36;
 d. \$239.76. By 236: a. \$118; b. \$2242; c. \$1154.04; d. \$2357.64.
 16. \$66. 17. \$119.20.

Page 187.—1. 11 seats. 2. 6 seats. 3. 162 fares. 4. \$8.10.
 5. \$.20. 6. 44 persons. 7. \$19. 8. \$21.25; \$.45. 9. 80 mi.
 10. \$2.45

Page 188.—4. \$957. 5. \$7353. 6. \$17.82. 7. 654 pt. 8. 10,140
 in. 9. 656 pk.

Page 189.—3. *a.* $4\frac{1}{2}$ gal.; *b.* 7 bu.; *c.* 10 yd.; *d.* 4 qt. 5. $35\frac{1}{2}$. 6. $55\frac{1}{2}$.
7. $79\frac{1}{2}$. 8. 133. 9. *a.* 6; *b.* 8; *c.* 1; *d.* 4; *e.* 9; *f.* $9\frac{1}{2}$. 10. *a.* $3\frac{1}{2}$;
b. $1\frac{1}{2}$; *c.* 2; *d.* 2; *e.* 7; *f.* $25\frac{1}{2}$.

Page 190.—3. *a.* 7; *b.* 8; *c.* $9\frac{1}{3}$; *d.* $13\frac{2}{3}$; *e.* 17. 4. *a.* $18\frac{2}{3}$; *b.* $14\frac{1}{3}$;
c. $14\frac{1}{3}$; *d.* $15\frac{2}{3}$; *e.* $20\frac{1}{3}$. 5. *a.* 3; *b.* $5\frac{1}{3}$; *c.* $5\frac{2}{3}$; *d.* $3\frac{1}{3}$; *e.* 3. 6. *a.* $4\frac{2}{3}$;
b. $3\frac{1}{3}$; *c.* 5; *d.* 13; *e.* 8. 7. 3 in.

Page 191.—2. \$3. 3. $6\frac{3}{4}$. 4. 7 gal. 5. $5\frac{3}{4}$ pk. 6. 9 bu.
7. 9 hr. 8. *a.* 11; *b.* 23; *c.* $36\frac{3}{4}$; *d.* $20\frac{3}{4}$; *e.* 27; *f.* 30. 9. *a.* $52\frac{1}{2}$.
b. 57; *c.* 90; *d.* 2; *e.* 29; *f.* 60. 10. $5\frac{1}{4}$. 11. 2. 12. 5. 13. 4.
14. 7. 15. $6\frac{1}{4}$. 16. $1\frac{1}{4}$. 17. $11\frac{1}{4}$. 18. 16. 19. $1\frac{1}{4}$. 20. 9.
21. 1. 22. $12\frac{1}{4}$. 23. $8\frac{1}{4}$. 24. $7\frac{1}{4}$.

Page 192.—7. $10\frac{3}{8}$. 8. $24\frac{3}{8}$. 9. $22\frac{1}{8}$. 10. $26\frac{3}{8}$. 11. $20\frac{5}{8}$.
13. $5\frac{1}{8}$; $15\frac{5}{8}$. 14. $6\frac{3}{8}$; $18\frac{1}{8}$. 15. $19\frac{1}{8}$; $35\frac{7}{8}$. 16. $13\frac{1}{8}$; $25\frac{3}{8}$. 17. $20\frac{1}{8}$;
 $52\frac{7}{8}$. 18. $31\frac{1}{8}$; $93\frac{5}{8}$. 19. $24\frac{3}{8}$; $102\frac{1}{4}$. 20. $2\frac{1}{8}$; $50\frac{7}{8}$. 21. 9; $27\frac{5}{8}$.
22. $20\frac{3}{8}$; $60\frac{3}{8}$.

Page 193.—1. 8 yd. 2. $1\frac{1}{2}$ gal. 3. 6 T. 4. $6\frac{1}{2}$ gal. 5. $1625\frac{1}{2}$ gal.
6. 59 bu. 7. $2\frac{1}{2}$ bu. 8. 11 in. 9. \$288. 10. 92 lb. 11. $68\frac{1}{4}$ ft.

Page 194.—1. 120 ft. 2. \$10. 3. \$26. 4. \$156. 5. 41.
6. \$68. 7. \$560. 8. \$133.44.

Page 195.—24. 50. 25. 30. 26. 72. 27. 72. 28. 96. 29. 204.
30. \$26. 31. \$18. 32. \$28. 33. \$28. 34. \$33. 35. \$50.
36. 9 lb. 37. 6 ft. 38. 4 yd. 39. 39 gal. 40. 6 bu. 41. 70 mi.
42. \$4.10. 43. \$4.20. 44. \$5.10. 45. \$5.30. 46. \$6.05. 47. \$30.

Page 196.—1. \$.96. 2. \$2.88. 3. \$23.75. 4. \$46.50. 5. \$480.
6. \$28.50. 7. \$.24. 8. \$.60. 9. \$7.50. 10. \$8.75. 11. \$7.98.
12. \$510. 14. \$1.02. 15. \$3. 16. \$9.90. 17. \$1.20. 18. \$1.50.
19. \$3.51. 20. \$2.70. 21. \$1.68. 22. \$3.96. 23. \$1.04.
24. \$4.35. 25. \$.50.

Page 197.—4. 34, r. 2056. 5. 27, r. 2340. 6. 34, r. 1075. 7. 12,
r. 2273. 8. 38, r. 204. 9. 16, r. 825. 10. 23, r. 878. 11. 17, r. 942.
12. 9, r. 1730. 13. 65, r. 1263. 14. 1877, r. 274. 15. 773, r. 198.
16. 718, r. 207. 17. 1134, r. 58. 18. 773, r. 466. 19. 1058, r. 212.
20. 924, r. 520. 21. 819, r. 553. 22. 1162, r. 270. 23. 174, r. 87.

Page 198.—1. 104 ft. 2. \$38.50. 3. \$4. 4. 320 min. 5. \$5.88.
6. \$32.25.

Page 199.—1. 28 yd. 2. \$6.44. 3. 19 caps. 4. \$1.26. 5. 30
pupils. 6. \$5.74. 7. \$6.81.

Page 200.—1. \$2.44 2. $6\frac{1}{2}$ sq. in. 3. $4\frac{1}{4}$ in.; 3 in.; $12\frac{3}{4}$ sq. in.
4. \$.03. 5. \$.12. 6. $1\frac{1}{4}$ in. 7. $13\frac{1}{2}$ in. by $15\frac{1}{2}$ in.

Page 201.—1. \$20. 2. \$1.26. 3. \$2.75. 4. \$10. 5. \$15.75.
6. \$64.80. 7. \$9.60. 8. \$4.25. 9. \$15.75. 10. \$40.50. 11. \$8.75.
12. \$14.25. 13. \$18. 14. \$12.46. 15. \$114.50. 16. \$17.20.

Page 202.—1. a. \$11 b. \$580.51; c. \$745.20. 2. a. \$19.30; b. \$370 c. \$664.74. 3. a. \$43.62; b. \$664.83; c. \$344.75. 5. a. \$2.35; b. \$1.69; c. \$3.26. 6. a. \$1.04; b. \$1.37; c. \$5.84. 7. a. \$3.09; b. \$1.81; c. \$10.15. 8. a. \$9.05; b. \$4.16; c. \$5.62. 9. a. \$9.12; b. \$5.34; c. \$12.21. 10. a. \$5.12; b. \$6.40; c. \$3.04. 11. a. \$45.64; b. \$32.97; c. \$62.57. 12. a. \$4681.25; b. \$3815.64; c. \$70.81. 13. a. \$2854.98; b. \$154.69; c. \$35.69. 14. a. \$80.22; b. \$106.24; c. \$4511.52. 15. a. \$54.47; b. \$29.91; c. \$4396.50.

Page 203.—2. 100 wk. 3. 12 lb. 4. 10 yd. 5. \$.72. 6. 325 bars. 7. 160 A. 8. 126 trees. 9. \$74. 10. 8 lb.

Page 205.—1. \$27. 2. \$420. 3. \$36.50. 4. \$15. 5. \$255. 6. \$15.75. 7. \$7.50. 8. \$23.90. 9. \$950. 10. \$24.75. 11. \$52.25. 12. \$52.50. 13. \$4.50. 14. \$54. 15. \$4.25. 16. \$8.12. 17. \$1.95. 18. \$4.50. 19. \$3.25. 20. \$7.20. 21. \$4.85. 22. \$3. 23. \$2.25. 24. 8¢. 25. \$3.25. 26. \$1.25. 27. \$3.09. 28. \$.25. 29. \$.15. 30. \$3.55. 31. 4¢. 32. \$.30. 33. 12¢. 34. \$1.50. 35. 7¢. 36. \$3.50. 37. \$.30. 38. \$.20. 39. \$.75. 40. \$1.75. 41. \$.15. 42. \$.50. 43. \$3.25. 44. \$.20.

Page 206.—3. 12. 4. 25 yd. 5. 12. 6. 15 ft. 7. 12. 8. 12 in. 9. \$.25. 10. 16 da. 11. 50 bu. 12. \$104. 13. 28 mi.

Page 207.—1. \$15.75. 2. \$8.25. 3. \$3. 4. \$10. 5. \$21.25. 6. \$6.36. 7. \$10. 8. \$85. 9. \$250. 10. \$1.90. 11. \$5.25. 12. \$9.60. 13. \$9. 14. \$18. 15. \$8. 16. \$21. 17. \$32. 18. \$22. 19. \$34. 20. \$16. 21. \$12. 22. \$19. 23. \$1.85. 24. \$2.38.

Page 208.—1. 7 cows. 2. \$2380. 3. 56 A.; \$1988. 4. \$8624. 5. \$140. 6. \$442.50. 7. \$1020. 8. \$40. 9. \$435. 10. \$1132.50. 11. \$21.60.

Page 209.—2. \$2. 3. \$4. 4. \$2.25. 5. \$2.50. 6. \$.90. 7. \$1.50. 8. \$9. 9. \$1. 10. \$2.50. 11. \$4.50. 12. \$7.50. 13. \$.60. 14. \$1.60. 15. \$3. 16. \$3.50.

Page 210.—1. 20 yd. 2. 462 ft. 3. 192 in. 4. 4 ft. 5. 5280 ft. 6. 5280 ft. 7. 60 in. 8. 10 ft. 9. 24 yd. 10. 35 ft. 11. 3750 ft. 12. 1980 ft. 13. 228 ft. 14. 5940 ft. 15. 810 yd.; 950 yd. 16. 42,240 ft. 17. 27,075 ft. 18. 9 mi. 19. 2640 ft.; 160 rd. 20. 7920 ft. 21. 66 ft.; 22 yd.

Page 212.—2. 2 gal. 3. 96 pk. 4. 432 sq. in. 5. 51 ft. 6. 1440 in. 7. 800 oz. 8. 12,000 lb. 9. 18 bu. 10. 11,250 ft. 11. 2 ft. 12. 1920 rd. 13. 120 yd. 14. 405 ft. 15. 774 sq. yd.

16. 11 doz. 11; 13 doz. 9; 16 doz. 3. 17. 1728 sq. in. 18. 78 sq. ft.
 19. \$.20 per bushel. 20. 1008 sq. ft. 21. 3600 ft.

Page 214.—3. 108 cu. in. 4. 64 cu. in. 5. 24 cu. in. 6. 1152 cu. in.
 7. 108 cu. in. 8. 60 cubes. 9. 30 pupils.

Page 215.—3. \$.13. 4. \$5940. 5. \$2.60.

Page 216.—2. 8624 gal. 3. 86. 4. 602. 5. 79°. 6. 25 da.

Page 217.—1. \$990. 2. \$11,900. 3. \$438.25. 4. \$9.24.
 5. \$5.24. 6. \$13.12.

Page 218.—1. 50,000,000 lb. 2. 1,250,000 lb. 3. 319,375,000 lb.
 4. 858,000,000 lb. 5. 6,000,000 T. 6. a. 35 oz.; b. 2 lb. 3 oz.
 7. 612,000,000 lb.; 306,000 T.

Page 219.—1. a. \$32,538.46; b. \$28,736.50; c. \$30,165.56.
 2. a. \$21,464.87; b. \$24,836.37; c. \$20,168.03. 3. a. \$20,184.93;
 b. \$21,878.20; c. \$24,181.02.

Page 220.—1. a. \$583.07; b. \$624.02; c. \$624.79; d. \$290.58.
 2. a. \$313.68; b. \$187.39; c. \$291.13; d. \$310.78. 3. a. \$303.47;
 b. \$110.29; c. \$90.95; d. \$175.40. 4. a. \$694.64; b. \$701.42;
 c. \$631.41; d. \$37.02. 5. a. \$572.26; b. \$249.69; c. \$610.77;
 d. \$101.35. 6. a. \$501.79; b. \$46.65; c. \$116.79; d. \$96.96.
 7. a. \$162.38; b. \$74.29; c. \$131.58; d. \$449.59. 8. a. \$87.99;
 b. \$780.47; c. \$461.10; d. \$278.17.

Page 221.—1. 1,650,315. 2. 4,848,332. 3. 4,790,440. 4. 5,700,950.
 5. 3,766,184. 6. 6,152,208. 7. 7,085,248. 8. 1,410,759. 9. 1,579,056.
 10. 2,515,456. 11. 1,817,586. 12. 425,802. 13. 3,175,035. 14. 6,840,288.
 15. 2,771,178. 16. 1,636,776. 17. 1,027,780. 18. 1,771,250.
 19. 2,899,584. 20. 6,442,944. 21. 3,300,300. 22. 3,433,020.
 23. 1,375,269. 24. 3,996,594. 25. 5,681,650. 26. 3,069,565.
 27. 5,644,224. 28. 2,818,044. 29. 3,821,477. 30. 2,713,290.
 31. 2,597,868. 32. 4,449,818. 33. 1,095,128. 34. 5,999,402.
 35. 3,552,000. 36. 671. 37. 598, r. 50. 38. 207, r. 25. 39. 392, r. 28.
 40. 2008, r. 9. 41. 957, r. 6. 42. 1044, r. 25. 43. 2089, r. 30.
 44. 757, r. 46. 45. 1279, r. 47. 46. 987, r. 64. 47. 954, r. 13.
 48. 810, r. 17. 49. 1234, r. 40. 50. 80, r. 25. 51. 307, r. 43.
 52. 267, r. 53. 53. 58, r. 174. 54. 42, r. 388. 55. 77, r. 237.
 56. 131, r. 400. 57. 113, r. 331. 58. 68, r. 591. 59. 103, r. 196.
 60. 133, r. 76. 61. 249, r. 186. 62. 83, r. 18. 63. 154, r. 307.

Page 222. — Set I: 1. 2,260,640. 2. 105 in. 3. 103, r. 351.
 4. \$403.75. 5. \$64.59. Set II: 1. $141\frac{1}{2}$. 2. 216 qt. 3. 9.
 4. $39\frac{1}{2}$. 5. 17. Set III: 1. 782,400. 2. 161, r. 1. 3. \$42.59.
 4. 76 qt. 5. \$82.50. Set IV: 1. \$52.50. 2. \$2.10. 3. \$2.08.
 4. \$.66. 5. \$9.80. Set V: 1. 3. 2. $\frac{3}{8}$. 3. $\frac{5}{8}$. 4. $\frac{1}{4}$. 5. $3\frac{1}{4}$ yd.
 Set VI: 1. \$.70. 2. \$.40. 3. \$2.53. 4. \$3.45. 5. \$4.95.

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TABLES FOR REFERENCE

Liquid Measures

2 pints (pt.) = 1 quart (qt.)
4 quarts = 1 gallon (gal.)

Dry Measures

2 pints (pt.) = 1 quart (qt.)
8 quarts = 1 peck (pk.)
4 pecks = 1 bushel (bu.)

Measures of Length

12 inches (in.) = 1 foot (ft.)
3 feet = 1 yard (yd.)
5½ yards } = 1 rod (rd.)
16½ feet }
320 rods } = 1 mile (mi.)
5280 feet }

Measures of Surface

144 square (sq.) inches = 1 square foot
9 square feet = 1 square yard

Avoirdupois Weight

16 ounces (oz.) = 1 pound (lb.)
2000 pounds = 1 ton (T.)

United States Money

10 cents (¢) = 1 dime
10 dimes } = 1 dollar (\$)
100 cents }

Counting

12 things = 1 dozen (doz.)
144 things = 1 gross (gro.)
12 dozen = 1 gross

Measures of Time

60 seconds (sec.) = 1 minute (min.)
60 minutes = 1 hour (hr.)
24 hours = 1 day (da.)
7 days = 1 week (wk.)
12 months } = 1 common
(mo.) } year (yr.)
365 days }
366 days } = 1 leap year

Thirty days have September,
April, June, and November.
All the rest have thirty-one
Save February, which alone
Has twenty-eight, and one day
more
We add to it one year in four.

